



COLONY AND PROTECTORATE OF NIGERIA

REPORT
ON THE
Medical and Health
Department
FOR THE YEAR
1931

NIGERIA :

*Printed by the Government Printer at the Government Printing Department, Lagos.
To be purchased from the C.M.S. Bookshop, Lagos, and from the Crown Agents
for the Colonies, 4 Millbank, Westminster, London, S.W. 1*

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Annual Medical and Sanitary Report on Nigeria for the Year ending 31st December, 1931.

I.—ADMINISTRATION.

A.—ESTABLISHMENT.*

(a) EUROPEAN STAFF.

MEDICAL.

- Director of the Medical and Sanitary Service.
- Deputy Director of Medical Service.
- 2 Assistant Directors of Medical and Health Service.
- 4 Assistant Directors of Medical Service.
- 5 Specialist medical officers (four appointed).
- 11 Senior medical officers.
 - 1 Alienist medical officer.
 - 1 Superintendent of the dispensers' training school.
- 88 Medical officers.
 - 4 Lady medical officers.
 - 2 Government dentists.
 - 2 Pharmacists.

CLERICAL.

- 1 Assistant accountant.
- 1 Office assistant.
- 4 Chief dispenser storekeepers.

NURSING.

- 2 Matrons.
- 9 Senior nursing sisters.
- 51 Nursing sisters.

TSETSE INVESTIGATION (TEMPORARY).

- 1 Deputy Director.
- 1 Sleeping sickness officer.
- 1 Entomologist.
- 1 Immunologist.
- 1 Biochemist.
- 1 Technical assistant.

LABORATORY.

- 1 Deputy Director of Laboratory Service.
- 1 Senior pathologist.
- 12 Pathologists (provision for 10).
 - 1 Research medical officer.
 - 2 Biochemists (one appointed and seconded to tsetse investigation).
 - 1 Immunologist (seconded to tsetse investigation).
 - 1 Entomologist (seconded to tsetse investigation).
- 7 Technical assistants (six appointed—one seconded to tsetse investigation).

SANITATION.

- 1 Deputy Director of Health Service.
- 1 Assistant Director of Health Service.
- 5 Senior health officers.
- 11 Medical officers of health.
- 33 Sanitary inspectors.

* Authorised strength ; for reduction effected during year see page 5.

(b) AFRICAN STAFF.

- 6 Medical officers.
- 2 Junior medical officers (temporary appointments).
- 1 Assistant accountant.
- 1 Chief clerk.
- 4 Assistant chief clerks.
- 13 First class clerks.
- 37 Second class clerks and probationers.
- 2 Chief dispensers.
- 7 Senior dispensers.
- 20 First class dispensers.
- 80 Second class dispensers.
- 35 Dispensers-in-training.
- 1 Chief storekeeper.
- 2 Assistant chief storekeepers.
- 3 First class storekeepers.
- 5 Second class storekeepers.
- 11 Senior nurses (nine provided).
- 32 Charge nurses.
- 73 First class nurses.
- 205 Second class nurses.
- 152 Nurses-in-training.
- 1 First class midwife.
- 5 Second class midwives.
- 7 Pupil midwives.
- 1 Charge attendant, Lunatic asylum.
- 25 Attendants, Lunatic asylum.
- 3 Senior wardens.
- 10 Wardens.
- 2 Assistant wardens.
- 10 Attendants, Leper asylum.

LABORATORY.

- 1 First class clerk.
- 1 Second class clerk.
- 3 First class laboratory attendants.
- 9 Second class laboratory attendants.
- 9 Third class laboratory attendants.
- 6 Laboratory attendants-in-training.

TSETSE INVESTIGATION.

- 1 First class clerk.
- 1 Second class clerk.
- 1 First class laboratory attendant.
- 1 Second class laboratory attendant.
- 1 Second class dispenser.
- 5 Second class nurses.

SANITATION.

- 10 First class sanitary inspectors (eight provided).
- 46 Second class sanitary inspectors (38 provided).
- 33 Third class sanitary inspectors.
- 24 Sanitary inspectors-in-training.
- 34 Sub-inspectors of sanitation.
- 64 Vaccinators.
- 1 Registrar of vital statistics.
- 2 Deputy registrars of vital statistics.
- 1 Assistant chief clerk.
- 3 First class clerks.
- 15 Second class clerks and probationers.

B.—LIST OF ORDINANCES, REGULATIONS, ETC., AFFECTING PUBLIC HEALTH ENACTED DURING THE YEAR.

ORDINANCES.

Serial No.	Date.	Short Title and Application.
8/1931	5.3.1931	An Ordinance to amend the Lunacy Ordinance.
16/1931	6.8.1931	An Ordinance to amend the Public Health Ordinance.

ORDERS-IN-COUNCIL.

Serial No.	Date.	Ordinance made under.	Provisions.
9/1931	16.2.1931	The Births, Deaths and Burials Ordinance.	Ordering certain areas of lands be used as public burial grounds for:— Agbor, Abak, Ikot-Ekpene, Opobo, Oron, Uyo, Kumba, Mamfe, Ijebu Ode, Aba, Ahoada, Bende, Degema, Okigwi, Owerri, Umuahia and Burutu.
10/1931	16.3.1931	The Dangerous Drugs Ordinance (No. 16 of 1927).	Ordering the application of Part III of the Dangerous Drugs Ordinance, 1927, to Dihydro-Morphinone and its salts and any preparation, admixture, extract or other substance containing any proportion of Di-hydro-Morphinone—And the application of the Order to British Cameroons, Protectorate and Colony.
15/1931	30.3.1931	The Public Health Ordinance.	The provisions of the Public Health Ordinance and Rules Nos. 2 of 1917 and 12 of 1918 Ordinance shall apply to the following stations, in the Northern Provinces:— Potiskum, Damaturu, Challowa, Maidobi, Dan-Gora, Yaku, Taura, Ringim, Gagarawa, Mallam Maduri, Gusau and Katsina.
19/1931	7.4.1931	do.	Application of Rules 35 of Rules No. 2 of 1917 made under the Public Health Ordinance to the third class townships of Opobo.
38/1931	7.9.1931	do.	Application of the whole of the Public Health Ordinance and Rules 1-25, 27(a), 31-33, 37-39, 41-50 and 67-82 of Rules No. 2 of 1917 to the area situate at Abakaliki in the Ogoja Province comprised within a circle having a radius of one mile with the district office at Abakaliki as centre.

ORDERS-IN-COUNCIL—*continued.*

Serial No.	Date.	Ordinance made under.	Provisions.
46/1931	19.10.1931	The Public Health Ordinance.	Application of the provision of the Public Health Ordinance and of Rules No. 2 of 1917 made thereunder to the Stations of Nguru in the Bornu Province and Kaura Namoda in the Sokoto Province.
50/1931	9.11.1931	The Births, Deaths and Burials Ordinance.	Ordering certain areas of lands to be used as public burial grounds for:— Aro, Itu and Warri.
56/1931	21.12.1931	do.	Ordering certain areas of land to be used as public burial grounds at Port Harcourt.
57/1931	—	do.	Ordering all births and deaths occurring amongst natives in the township of Port Harcourt to be registered with effect from 1st April, 1932.

ORDERS.

11/1931	19.3.1931	The Townships Ordinance.	Ordering the town of Agege to be a third class township under the Townships Ordinance.
12/1931	23.3.1931	do.	Ordering alteration of the classification of Opobo township to a third class township with effect from 1st April, 1932.
37/1931	31.8.1931	do.	Ordering the town of Itu to be a third class township under the Townships Ordinance.

REGULATIONS.

11/1931	30.3.1931	The Quarantine Ordinance, 1926 (No. 18 of 1926).	Amendment to Regulation 15 of the Quarantine Regulations, 1930, by the deletion of Sub-regulation (5) of the words "Except those exclusively" and by the substitute of the words "including those."
20/1931	6.7.1931	do.	Ordering the charging of fees under Regulation 15 (5) of the Quarantine Regulations, 1930.
22/1931	27.7.1931	The Hospital Fees Ordinance.	Amendments to the Regulations 2, 3, 12 and the principle Regulations 13A, 15A, 16A and 16B.
31/1931	28.9.1931	The Poisons and Pharmacy Ordinance, 1927 (No. 15 of 1927).	Amendments to Regulation 12 of the Poisons and Pharmacy Regulations, 1927.

C.—FINANCIAL

	£	s.	d.
Revenue	8,816	9	11
Approved Expenditure, 1931-32	523,118	0	0
Approved Expenditure, 1931-32 reduced owing to financial stringency	485,416	0	0
Actual Expenditure	477,676	4	8

The approved expenditure was roughly one-twelfth of the total expenditure of Nigeria for 1931-32. After reduction had been effected the expenditure was still roughly one-twelfth of the total reduced expenditure of the country.

In addition, the Native Administrations of the Northern and Southern Provinces expended £71,928 upon medical and health service, or 3.5 per cent and 3.4 per cent respectively of their total expenditure.

II.—PUBLIC HEALTH.

A.—GENERAL REMARKS.

The following table indicates the general hospital work carried out during the year as compared with previous years:—

Total cases treated.	1928.	1929.	1930.	1931.
EUROPEANS :—				
In-patients	1,553	1,470	1,412	1,245
Out-patients	8,629	8,181	7,917	7,630
Total Europeans	10,182	9,651	9,329	8,875
AFRICANS AND OTHER NON-EUROPEANS :—				
In-patients	29,173	32,068	37,517	35,738
Out-patients	354,191	391,008	399,260	481,759
Total Africans	383,364	423,076	436,777	517,497

Owing to the depressed financial position of the Colony it was necessary during the year to reduce European personnel. This was effected by retrenchment and by keeping vacancies unfilled. As little reduction as possible was made of the clinical and health staff, the reduction being made at the expense of the higher administrative staff and that of the laboratory service. Plans were made at the end of the year to centralise the medical administration to Lagos and to close the medical offices at Kaduna and Enugu in order to enable the administration to be carried on by a smaller staff. The reduction of European personnel which had occurred or was impending at the end of the year was as follows:—

Administrative staff	reduced from	10 to	5
Pathological and research staff	„ „	16 to	10
Various specialist appointments	„ „	8 to	5
Clinical medical staff	„ „	104 to	98
Health officers	„ „	15 to	14
Matrons	„ „	2 to	1

No reduction was made in the African technical staff and the training of this staff has proceeded satisfactorily. There are now 78 pupils at the Medical School at Yaba who are under instruction as follows :—

	Government Pupils.	Private Students.
School of Pharmacy	20	29
Medical School (first year) ...	13	—
„ „ (second year) ...	15	1

At the School of Pharmacy at Zaria ten pupils from the Northern Provinces are under instruction. The second year students of the Medical School passed their preliminary examination in biology, chemistry and physics and are now taking anatomy, physiology and organic chemistry. The new Higher College will be commenced by the Education Department in 1932, and this will relieve the Medical School in future of the teaching of biology, chemistry and physics.

During the year the scheme of opening a large number of dispensaries, financed by the Native Administrations, was proceeded with. The attendants who had been under training for a year or more at 26 medical stations throughout the country were examined and were posted to the new dispensaries, of which 61 were opened in the Northern Provinces and 73 in the Southern Provinces. The work carried out at these dispensaries is described under Section VI.

Owing to the reduction in the staff of the laboratory service, mentioned above, it is no longer possible to maintain pathological laboratories at Calabar and Kano. The Medical Research Institute at Yaba with the vaccine laboratory and the clinical laboratory at the African Hospital, Lagos, are being run by a staff of three pathologists, of whom two are on duty throughout the year and one on leave. A commencement has been made with research upon schistosomiasis under a grant made from the Colonial Development Fund, and one pathologist is now carrying out this research using the pathological laboratory at Zaria as his base.

I.—GENERAL DISEASES.

A return of diseases and deaths for 1931 is shown in Tables IV and V. The incidence of disease groups is shown in diagramatic form.

212 cases of malignant growths came under treatment as compared with 167 in 1930. Each year shows an increase in the number of cases diagnosed. Reference to these is made in the report of the laboratory service.

There is a general impression that the unemployment caused by depression of trade has led to an increase in the number of cases of tropical ulcer. Altogether 46,803 cases were treated at hospitals during the year, but this represents only a small proportion of the actual incidence. In addition, 7,511 cases were treated during a period of five months at Native Administration dispensaries in the Northern Provinces and 13,126 cases at Native Administration dispensaries in the Southern Provinces.

Cases of various forms of deficiency diseases are reported from time to time and it is probable that much ill-health must be caused by a lowered resistance to infections caused by unbalanced diets. 15 cases of beri-beri were reported. No cases of pellagra were reported, but an interesting series of cases of retrobulbar neuritis associated with sore tongue and mouth and occasionally pruritis of scrotum was reported by Dr. G. D. Fitzgerald Moore. The cases yielded to treatment

with marmite, an alcoholic extract of which has been prepared by Dr. McCulloch, Dietetics Pathologist. In the Northern Provinces the medical mission at Shellem reported 20 or 30 cases of "nightblindness," which responded quickly to treatment with cod-liver oil and malt, and an interesting note was made to the effect that the disease is recognised by the local African population who treat it by giving the fresh liver of the diuker antelope. In this connection the Dietetics Pathologist has pointed out the value to Nigeria of the vitamin A content of red palm oil which forms part of prison diets. Dr. McCulloch has also found that the leaf of the baobab tree, which is eaten extensively in the Northern Provinces, contains in specimens obtained locally a high content of calcium (2.3 per cent) and of P_2O_5 (about 1.0 per cent) which is of importance with regard to the absence of rickets.

II.—COMMUNICABLE DISEASES.

(a) MOSQUITO OR INSECT BORNE.

Malaria.—Preventive measures are described under Section III. The incidence of malaria as shown from hospital attendances during the past three years is given below :—

			1929.		1930.		1931.	
			Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
EUROPEANS :—								
Malaria ...	...	...	1,336	5	1,334	1	1,170	...
Blackwater ...	...	...	15	8	17	4	18	4
AFRICANS AND OTHER NON-EUROPEANS :—								
Malaria ...	...	...	23,001	43	29,430	41	35,800	40
Blackwater ...	...	...	5	1	6	2	12	1

In the report for 1930 an attempt was made to show the seasonal variation of clinical signs of malaria as shown from hospital attendances at stations in four groupings according to rainfall. The seasonal variation as shown by demonstration of blood parasites has been worked out by Dr. G. W. St. C. Ramsay, pathologist, for the station of Calabar which is in the heavy rain belt. He reports as follows upon the seasonal incidence of malaria, and also of filarial infection, and upon the age incidence :—

"During the three years that I was stationed in Calabar, which has an annual rainfall of about 122 inches, I made a study of the seasonal variations and age incidence of malaria, using as my criterion of infection the presence or absence of malarial parasites in the peripheral blood.

1.—SEASONAL INCIDENCE OF MALARIA.

In this survey the method adopted was to examine the blood of some ten to fifteen adult patients per day and note in how many malaria and other parasites were present. The patients were selected at random from the out-patient department of St. Margaret's Hospital by a laboratory attendant; they were all between the ages of 16 and 38 years, the average age being 23.4 years. In each case a thick blood film, unfixed and stained with dilute Giemsa's stain, was examined. The total number of patients considered in this series is 6,583. Table 1 shows the seasonal incidence of malaria and the relative proportions in which the various parasites were encountered; and Graph 1, in which sub-tertian and quartan malaria are grouped together, illustrates the incidence of the disease in relation to the rainfall.

SEASONAL INCIDENCE OF MALARIA.

Month.	Total.	Subtertian.	Quartan.	M. perst.	M. loa.	M. banct.
		%	%			%
January	575	12·6	2·3	30·1	5·5	0·2
February	570	12·2	1·6	30·0	5·0	0·2
March	526	11·5	2·0	30·5	3·7	0·1
April	588	11·1	1·4	30·6	5·9	0·2
May	540	19·0	3·2	30·6	3·4	0·3
June	549	19·6	3·6	31·5	4·4	0·2
July	530	12·7	2·3	31·3	3·6	0·2
August	536	13·0	1·8	31·2	4·3	0·2
September	531	9·2	1·6	31·4	4·6	0·1
October	524	9·4	1·6	31·5	3·6	0·1
November	553	12·1	2·0	30·0	3·7	0·2
December	560	12·3	1·9	30·0	2·7	0·2

A glance at the graph will show that during the relatively dry period of the year from November to April the incidence of malaria remains fairly constant at about 14 per cent. During this period the average rainfall is approximately four and a half inches per month. In May and June a sharp rise in the malarial incidence takes place, and is followed by an equally sudden return to normal in July and August. In September and October malaria is at its minimum (11 per cent), a fact which may perhaps be explained by the almost constant washing out of the pools, tree holes, and other mosquito breeding places by the heavy rains which from August to October average about $17\frac{1}{2}$ inches per month.

Table 1 shows that quartan malaria is not scarce in the Calabar area, being present on an average in two per cent of the adult population. Quartan malaria increases *para passu* with sub-tertian malaria during May and June when the disease as a whole reaches its fastigium. The average ratio of quartan to sub-tertian malaria is as 1 is to 6.

Microfilaria.—When this work was commenced one of the objects in view was to ascertain if any seasonal variation could be detected in the proportion of individuals harbouring microfilaria. The films were all taken at about 8 a.m., and no attempt was made to obtain a series of films taken during the night for the study of *M. bancrofti*. From Table 1 it will be observed that there appears to be no seasonal variation in the proportion of patients with microfilaria. From the study of a single thick blood film (about 0.1 c.c.) *M. perstans* is encountered in rather over 30 per cent of patients while *M. loa* is found in an average of 4.2 per cent.

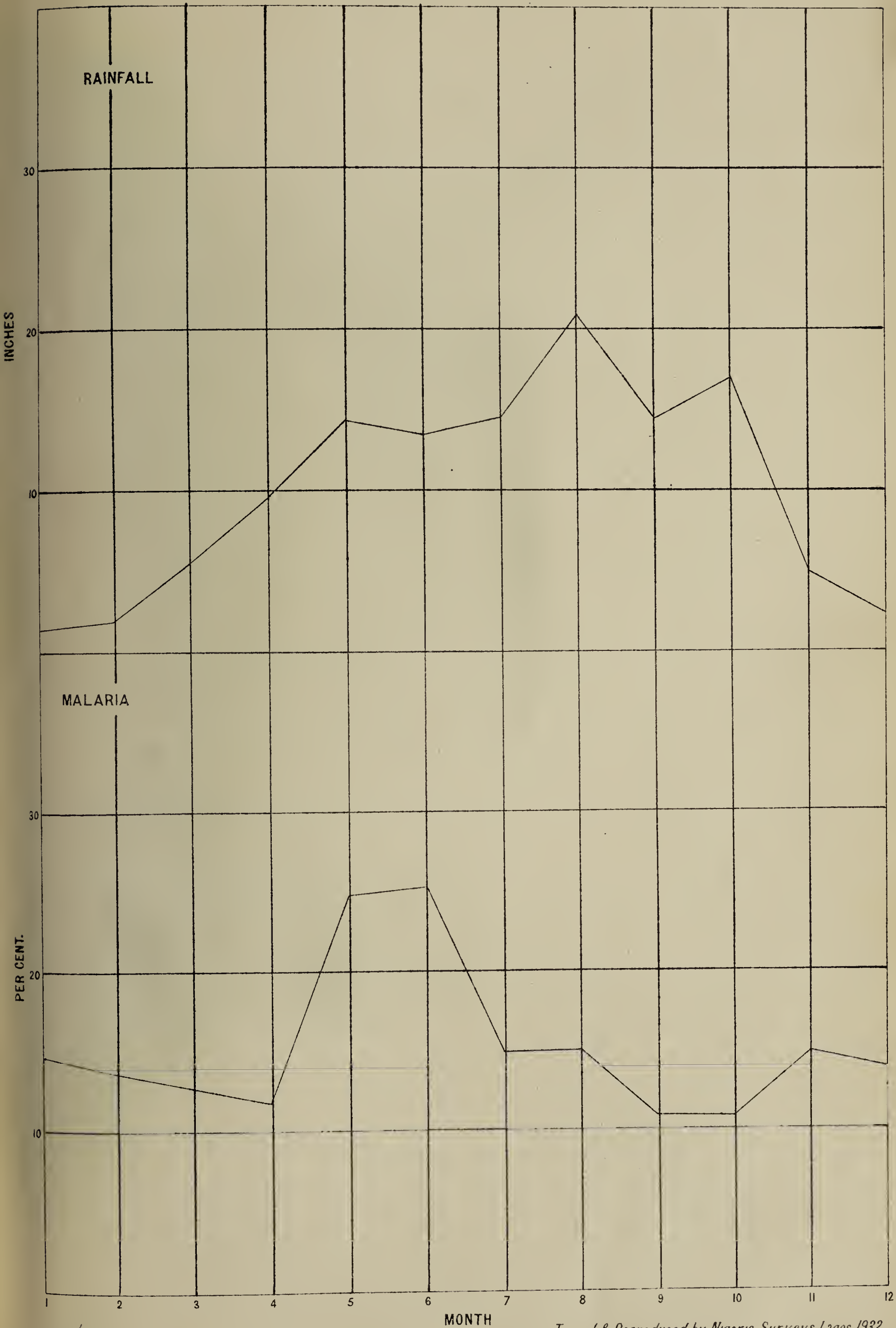
II.—AGE INCIDENCE IN MALARIA.

For this study the blood of 200 children at each year of life between the ages of four and 16 years was examined for the presence of malarial parasites and microfilaria. The series thus totals 2,600, of which 1,690 children were obtained from the schools in Calabar, the remainder being taken from the out-patient department and wards of St. Margaret's Hospital. It is a pleasure for me to acknowledge here the help which I at all times received from the Rev. J. K. Macgregor, principal of the Hope Waddell Training College, and from Mr. Hart, of Duke Town School, each of whom were most considerate in allowing me to examine their pupils.

The method of work was the same as in the other series (*supra*), viz.—an examination of thick blood films (about 0.1 c.c.) stained in dilute Giemsa's stain without preliminary fixation. The results are shown in Table II and Graph II, from which it will be seen that between

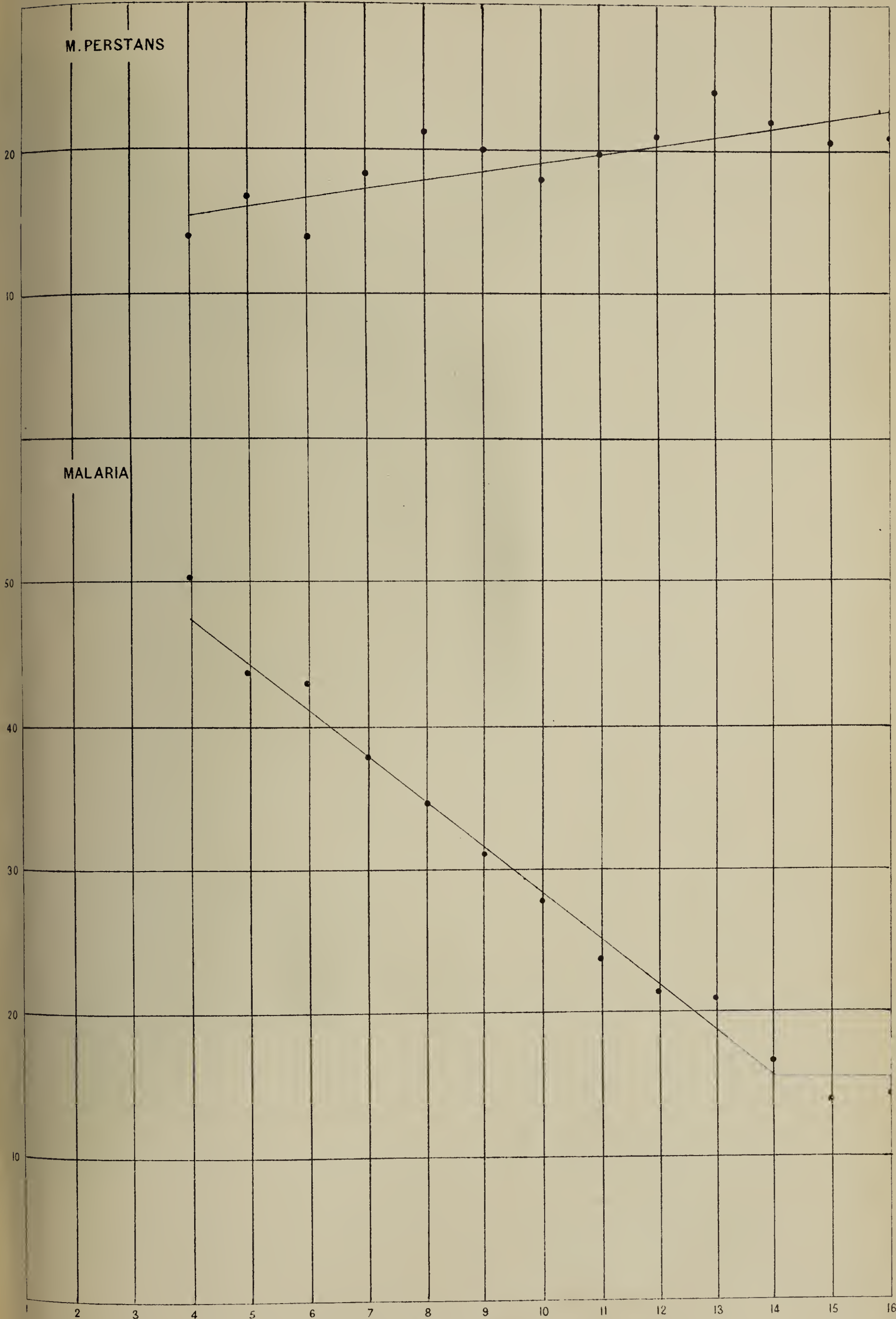
MONTHLY INCIDENCE OF RAINFALL AND MALARIA,
CALABAR, 1928-1931.

GRAPH I.



AGE INCIDENCE OF MALARIA AND MICROFILARIA PERSTANS

GRAPH 2.



the ages of four and 14 years there is a steady fall in the proportion of children showing malarial parasites in their blood; and that the series is one of simple arithmetical progression. The rate of fall of the malarial incidence in Calabar averages 3.23 per cent with each year of life, and by using the following simple formula it is possible to calculate the incidence of malaria at any given age between four and 14 years :—

$$M_a = K - d(A - 1).$$

Where M_a = Malarial incidence at age A.

K = Constant.

d = Rate of fall per annum.

A = Age.

In this series the constant, K, is 58. For example, to find the incidence of malaria at ten years of age.

$$\begin{aligned} M_{10} &= 58 - 3.23(10 - 1). \\ &= 29 \text{ per cent.} \end{aligned}$$

The results obtained in Calabar afford a striking confirmation of those obtained by Kligler in Palestine (Trans. Roy. Soc. Trop. Med. & Hyg., 1930. XXIV. 3, p. 331).

Kligler found that the incidence of malaria is highest during the first ten years of life and decreases progressively with increasing age; and, while his results in Jerusalem indicate a higher infection rate than in Calabar, his figures show a more rapid fall with increasing years, the fall again being in arithmetical progression.

TABLE II.

INCIDENCE OF MALARIA AND MICROFILARIA IN CHILDHOOD.

Age.	Total.	Subtertian	Quartan	M. perst.	M. Loa
		%	%	%	%
4	200	40.5	10.0	14.0	0.5
5	200	34.5	9.5	17.0	1.0
6	200	34.5	8.5	13.5	1.0
7	200	32.5	5.5	18.5	1.5
8	200	28.0	7.0	21.5	1.0
9	200	25.5	6.0	20.0	1.0
10	200	22.0	6.0	18.0	1.5
11	200	20.5	3.0	20.0	3.0
12	200	18.5	3.0	21.0	2.5
13	200	18.0	3.0	24.0	2.5
14	200	15.0	2.0	22.0	2.5
15	200	12.5	1.5	20.5	3.5
16	200	12.0	2.5	21.0	3.0

One fact which emerges from an analysis of Table II is that infection with quartan is a common occurrence in early life. It has been shown (Table I) that among adults averaging 23 years of age one case of quartan malaria is met with to every six of sub-tertian malaria whereas in children of four years it averages 1 to 4.1, while from 11 to 16 years the ratio falls to 1 to 6.4.

Microfilaria.—At the age of about four years some 15 per cent. of children show *M. perstans* in the peripheral blood, while *M. loa* is encountered in about one per cent.

The incidence of both parasites rises slowly until by about the sixteenth year *M. perstans* is found in 22 per cent and *M. loa* in three per cent.

SUMMARY.

1. The seasonal incidence of malaria in Calabar has been worked out from a series of 6,583 individuals averaging 23 years of age.

2. The criterion of infection has been taken to be the presence of malarial parasites in about 0.1 c.c of the peripheral blood.

3. It is shown that from November to April the incidence to malaria is 14 per cent; that in May and June it rises to 22 per cent; that it returns to normal in July and August; and that it is at its minimum in September and October.

4. The incidence of malaria at various ages between four and 16 years has been studied in a series of 2,600 children.

5. It is shown that the proportion of children with malarial parasites in the blood declines from 48 per cent at the age of four years to 16 per cent at the age of 16 years; and that the decline is in arithmetical progression.

6. A simple formula is given by means of which the malarial incidence may be calculated in children of different ages.

7. It is shown that quartan malaria is relatively common in Calabar; one case of quartan being seen to every four of sub-tertian malaria between the ages of four and 16 years, while the ratio is 1 to 6 in adult life.

8. The incidence of *M. perstans* and *M. loa* is shown at different ages, and it is indicated that there is no seasonal variation in the proportion of individuals harbouring these parasites."

Trypanosomiasis.—The work carried out by the tsetse investigation and by the officers attached for sleeping sickness work is described in Appendix B. It will be seen from that report that the position with respect to sleeping sickness in the Northern Provinces is serious. Some 5,000 cases were treated by the sleeping sickness staff and 3,000 cases were diagnosed by the survey parties and were awaiting treatment at the end of the year. In addition, 3,466 cases were treated at hospitals and dispensaries during the year, of which 62 cases were treated in the Southern Cameroons by the medical officer detailed for sleeping sickness duty at Buea and 92 at Victoria. A report by the latter officer shows that upon the plantations 2,056 labourers were examined and 18 cases were found and treated. Examination of 1,536 other persons in the neighbourhood of Tiko gave a further 44 cases.

The method of mass examination by a survey party followed by a treatment party, which is now adopted in the campaign in the Northern Provinces, shows the great value of this method. The training of Hausa lads for this work has been most successful, and the staff of these trained boys will be increased from 24 in 1931 to 72 in 1932. An interesting experiment of adding a campaign of yaws treatment to the sleeping sickness campaign has been started in the Plateau Province.

(b) INFECTIOUS DISEASES.

Tetanus.—No European cases occurred. 63 cases, with 25 deaths, were reported in Africans.

Rabies.—No cases were reported in Europeans, but a considerable number of Europeans and Africans received anti-rabic vaccine treatment during the year, following dog-bites. 18 cases with three deaths were reported in Africans, death occurring in one untreated case 21 days after the dog-bite. 22 brains from dogs and one from a

cat were examined at the Medical Research Institute for Negri bodies, 11 dogs and the cat being positive. In the Northern Provinces five dogs' brains were examined at the veterinary laboratory and four were positive.

Dysentery.—Case incidence as compared with previous years is shown below :—

		EUROPEAN.			AFRICAN.		
		1929.	1930.	1931.	1929.	1930.	1931.
Amœbic	Cases ...	111	164	102	2,826	2,893	2,980
	Deaths	—	—	1	83	79	81
Bacillary	Cases ...	36	32	27	220	285	128
	Deaths	1	—	—	22	29	21
Undefined	Cases ...	22	22	10	1,011	1,276	1,117
	Deaths	—	—	—	53	36	25
Liver Abscess	Cases ...	14	—	2	112	73	160
	Deaths	—	—	2	7	8	20
Total Cases ...		183	218	141	4,169	4,527	4,385
Total Deaths ...		1	—	3	165	152	147

A study of the Flexner strains of bacillary dysentery by Dr. Young is reported in Appendix A. No case of shiga dysentery was found.

Venereal Diseases and Yaws.—The table given below shows the number of African patients who have come under treatment during the past five years :—

			1927.	1928.	1929.	1930.	1931.
Yaws	...	...	16,952	29,079	42,126	39,943	56,346
Syphilis	...	...	8,516	12,915	15,828	13,698	17,396
Gonorrhœa	...	...	7,012	8,927	12,018	12,940	13,716

The large number of cases of yaws treated has been possible owing to the general adoption by the medical staff of bismuth therapy and the results of this treatment have on the whole been very satisfactory. It will take some time before African patients will appreciate the slower results obtained by bismuth treatment compared with those by N.A.B. and the more rapid and painful bismuth sodium tartrate (Sobita) is generally the most popular form of bismuth in spite of the risk of stomatitis. Other preparations used in treatment have been bismuth sodium tartrate in oil, bisoxyl, casbis and hoecht 4,005.

An important advance in the campaign against yaws has been made by attaching an extra medical officer to one of the sleeping sickness survey parties for the purpose of anti-yaws work. This experiment was carried out in the Wana district of the Plateau Province. Thanks to the fine co-operation of the political staff, 9,830 inhabitants in this pagan district were examined, which was 98.7 per cent of the total population. A further 38,000 people of this tribe

remain to be examined. It was found that the Kahn test could be carried out under bush conditions, and this test is being used on a large scale to estimate the effect of treatment which is being carried out with sobita.

Treatment of the population for yaws upon a large scale has been planned in the Bamenda Division of the Cameroons Province where a large number of native attendants are being trained in the technique of bismuth injection in order that one attendant may be available under each village head.

A medical census which was taken during the year by two health officers in representative belts of country will give interesting data concerning the incidence of yaws and venereal diseases, and will form part of the census report.

In the Cameroons an interesting comparison is made in that report between the hill people and the forest people. In the former venereal diseases and yaws are almost absent and in the latter yaws is universal and gonorrhœa is extremely prevalent. This is reflected in the figures obtained showing infant mortality, sterility, etc. :—

	Hill Tribes	Forest Tribes		
	Assumbo	Keaka	Banyangi	Ekwe
Infant Mortality (per 1,000 births)	250	288	260	340
Miscarriages	5%	14%	12%	15%
Sterility	0·5%	10%	8%	13%
Pregnancies per completed marriage	6-7	3-4	6-7	4

A similar instance to that reported from Bauchi in the report for 1930 has been recorded from Adamawa Province where syphilis and gonorrhœa are common diseases in the Fulani towns, whereas they are rare amongst the surrounding pagan tribes. Yaws is common amongst these pagans and is known by the Fulani as “pagan syphilis”.

An interesting study upon the incidence of yaws and syphilis at Calabar with an analysis of 5,000 Sachs-Georgi tests, prepared by Dr. Ramsay, is given in Appendix C.

Tuberculosis.—In Lagos, where registration of deaths is compulsory, 133 deaths were certified as having been caused by tuberculosis of the respiratory organs, and 42 deaths as due to tuberculosis of other organs. Hospital returns throughout the rest of the country show that 653 cases of pulmonary tuberculosis with 122 deaths came under treatment and 186 cases of other forms of tuberculosis with 16 deaths. Bovine tuberculosis is of very rare occurrence in Nigeria, but two cases of massive infection were discovered at Lagos in bullocks brought down from the Northern Provinces.

Leprosy.—In Nigeria four leprosaria are being maintained by Government, 20 by Native Administrations, and seven by religious missions. Three large new leprosaria are under construction—at Ossiomo in Benin Province a camp for 500 lepers with ample farm land is being built from fund granted by the Colonial Development Fund. At Uzuakoli a camp for 500 lepers is being built by the Owerri Province Native Administrations and will be supervised by a mission doctor engaged by the Primitive Methodist Mission. At Victoria a camp for 50 lepers with ample farm land is being built by the Native Administration assisted by a grant from Government.

Lepers are being treated in these farm colonies successfully, but the number of inmates varies from time to time as segregation is entirely voluntary. The average population of the settlements was as follows during 1931 :—

✓ Lagos	33	• Katsina	214
✓ Onitsha	40	• Maiduguri	230
• Lokoja	10	• Gusau	74
✓ Abeokuta	35	• Zuru	11
✓ .. (Mission)	20	• Azare	19
✓ Abakaliki	40	• Bauchi	80
✓ Bamenda	80	✓ Itu	950
✓ Bauso	20	• Garkida	162
✓ Kumba	73	• Mkar	400
✓ Benin Group	327	• Akbacha	45
• Zaria	130	• Diko	11
Total	3,004		

At all hospitals in the country a certain number of lepers are treated as out-patients. Some 2,000-3,000 lepers receive intermittent treatment in this way, but the results of such intermittent and non-regulated treatment are naturally disappointing.

Other infectious diseases are dealt with under Section III.

(c) HELMINTHIC DISEASES.

In view of the almost universal incidence of helminthic infection the figures given in hospital returns merely indicate the relative frequency with which symptoms may be sufficiently serious to lead the patient to seek treatment. The following cases were treated at hospitals :—

	Hospitals.	N. A. Dispensaries, N. P. *	N. A. Dispensaries, S. P. †
Ankylostomiasis	2,191	192	...
Taeniasis	7,057	3,458	999
Ascariasis	17,828	702	9,456
Dracunculosis	3,049	782	897
Schistosomiasis	60	196	...

* In five months.

† In six months.

In the course of routine examination of 1,025 school children at Lagos during the year the following infection rate was found :—

Ankylostomiasis	88 cases.
Ascaris	320 „
Ascaris and ankylostomes	251 „
Schistosomiasis	5 „

The administration of chenopodium-castor oil mixture to all school children inspected was continued.

In 1926 a report was submitted by Dr. Naudi upon the ankylostome infection rate at the Udi coal mines. These mines were re-examined in 1931 by Dr. Merrett, who found the following infection rate :—

Mine.	SURFACE LABOURERS.		UNDERGROUND LABOURERS.	
	No. Examined.	Percentage infected.	No. Examined.	Percentage infected.
Iva Valley	181	44.75	664	45.03
Udi	29	30.21	17	22.57

In 1926 the infection rate was 43.36 per cent. The infection rate of the population, as taken from prison figures, was found by Dr. Merrett to be 36.9 per cent (366 prisoners examined). The distinction between surface and underground labourers means little since the duties of many of the surface men entail a considerable amount of work underground in the main galleries.

The number of cases of schistosome infection treated at hospital gives no indication of the widespread infection with this trematode in certain parts of the country, more particularly in the north. Dr. Ramsay, who has commenced research upon this parasite, has found roughly 60 per cent infection in children with a falling infection rate as age advances. The Fairley skin test, however, was positive for both children and adults for about 85 per cent. Three cases of schistosomiasis occurred in Europeans during the year.

Dr. Libert, at Bamenda, reported an infection of lung with ova identical with paragonimus, which was confirmed at the Medical Research Institute. Evidence points to the infection having occurred through eating dried crayfish imported from Duala, which may possibly have come from Asia.

B.—VITAL STATISTICS.

(1) GENERAL POPULATION—AFRICAN.

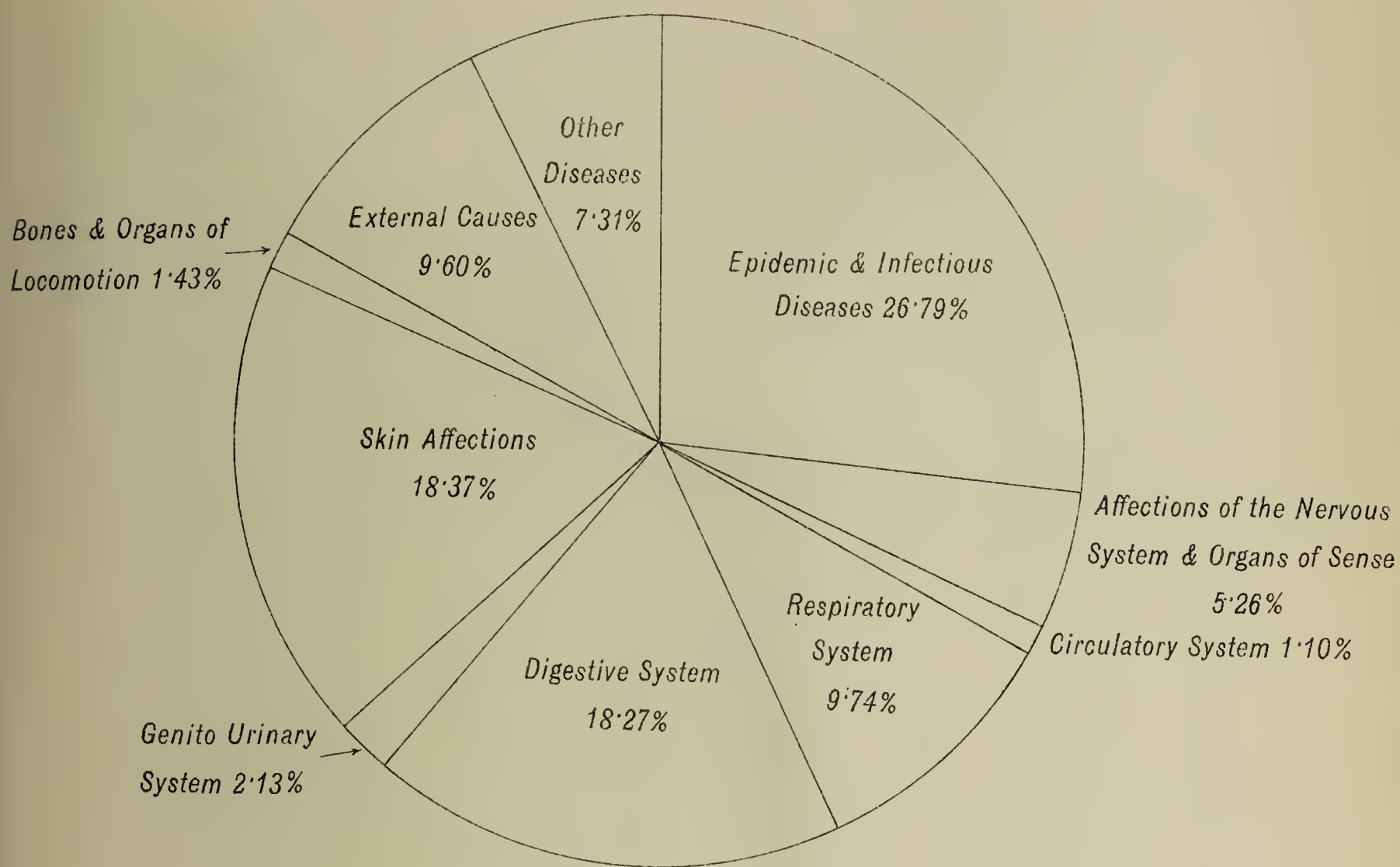
The estimated population of Nigeria, including the territory of the Cameroons under British mandate, is 20,762,000.

Registration of births and deaths amongst the African population is at present compulsory only in Lagos and Ebute Metta. It is hoped next year to obtain figures also from Port Harcourt, and in many Native Administration areas; a commencement has been made with registration by the Native Administrations of deaths but no accurate figures are as yet obtainable.

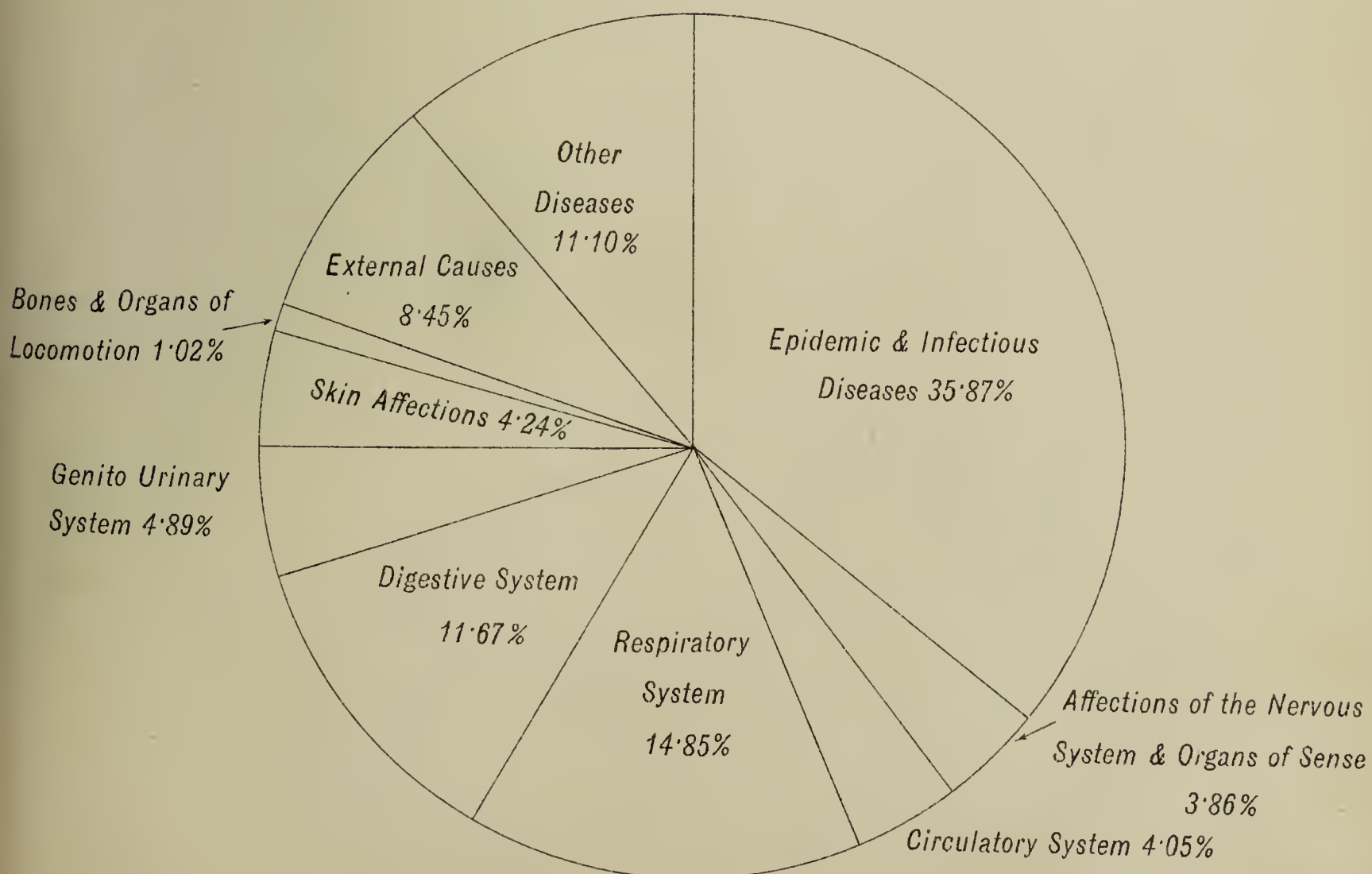
The vital statistics for the Lagos area are summarised in the following table:—

	1931.		
	Lagos.	Ebute Metta.	Total.
Estimated population (Lagos and Ebute Metta)	—	—	140,000
Total births	2,751	700	3,451
Birth rate per 1,000 population	—	—	24.6
Total deaths	1,449	327	1,776
Death rate per 1,000 population	—	—	12.6
Deaths—causation of—certified by Medical Practitioners—number	1,449	327	1,776
Deaths—causation of—certified by Medical Practitioners—per cent.	100%	100%	100%
Deaths—Infants under one year	298	88	386
Infantile mortality per 1,000 births	108.3	125.7	111.8
Deaths under one year—certified by Medical Practitioners—number	298	88	386
Deaths under one year—certified by Medical Practitioners—per cent.	100%	100%	100%
Deaths—Children under five years	547	128	585
Percentage of deaths of children under five years to total deaths	31.5%	39.1%	32.9%
Total stillbirths	65	13	78
Stillbirths—proportion per cent. of the total births (normal and stillbirths)	2.3	1.8	2.2
Deaths uncertified by Medical Practitioners—number	Nil	Nil	Nil
Deaths uncertified by Medical Practitioners—per cent.	Nil	Nil	Nil

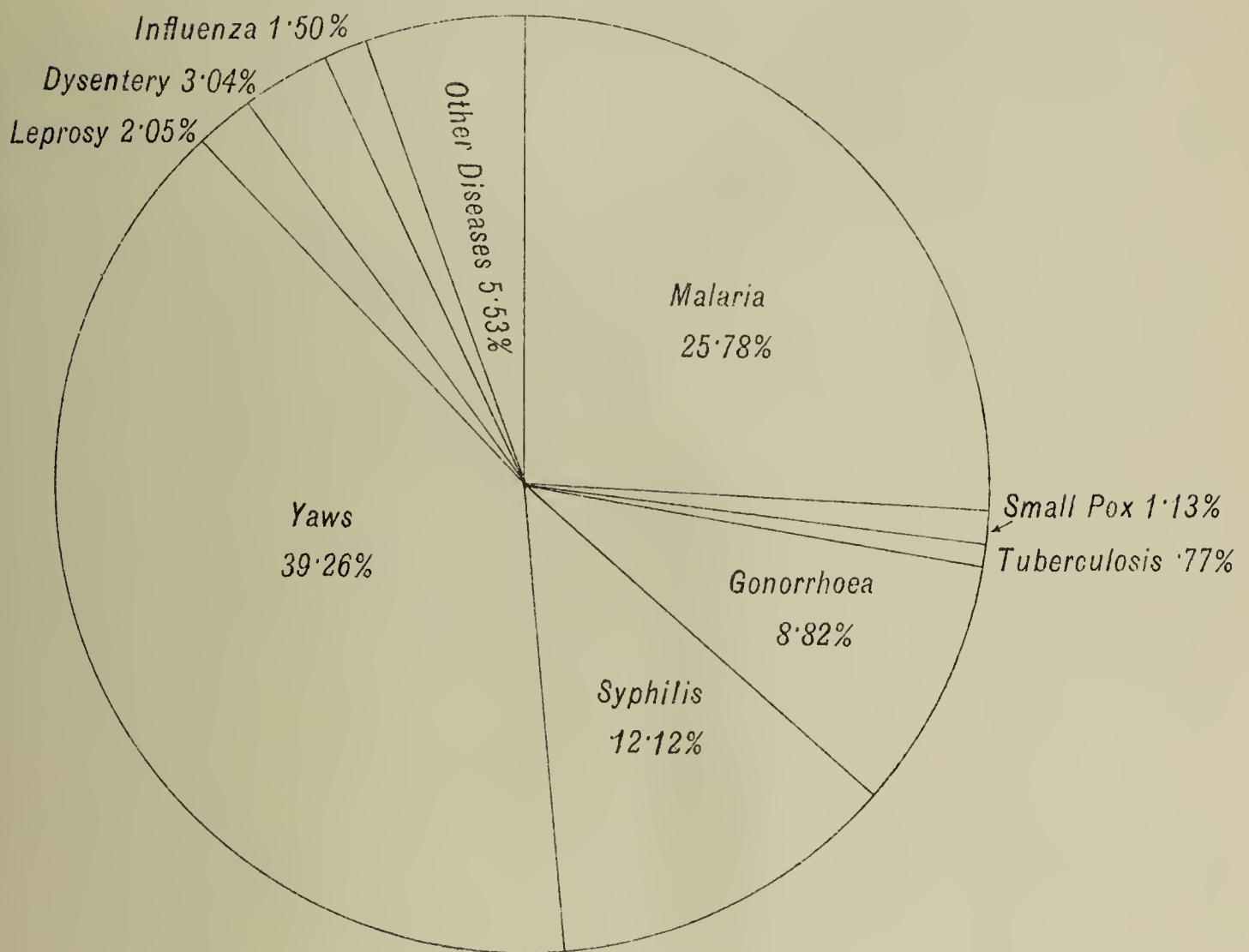
GENERAL SYSTEMIC & PREVENTABLE
DISEASES
TREATED IN GOVERNMENT INSTITUTIONS
TOTAL CASES 535,663
1931



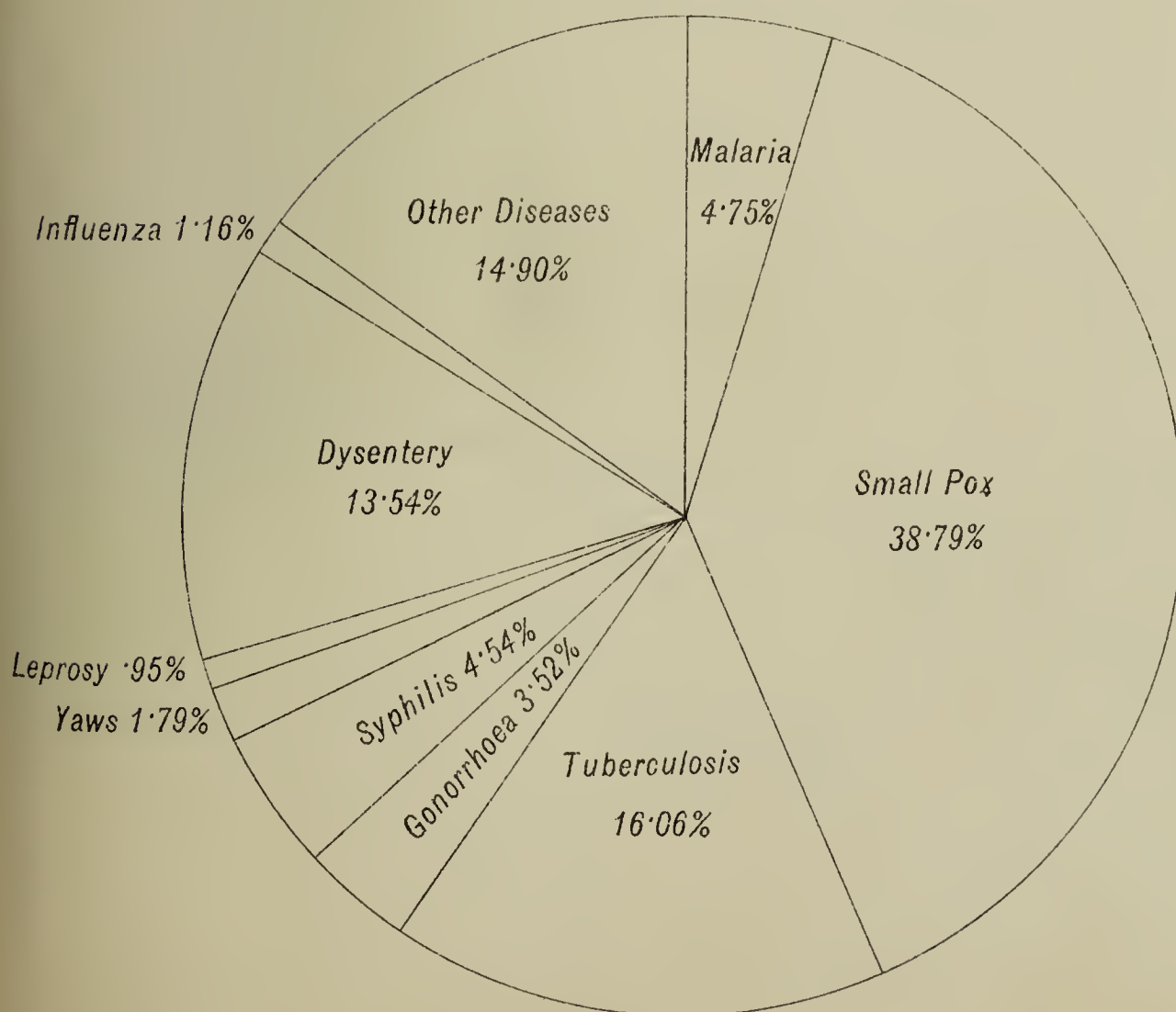
TOTAL DEATHS 2,639



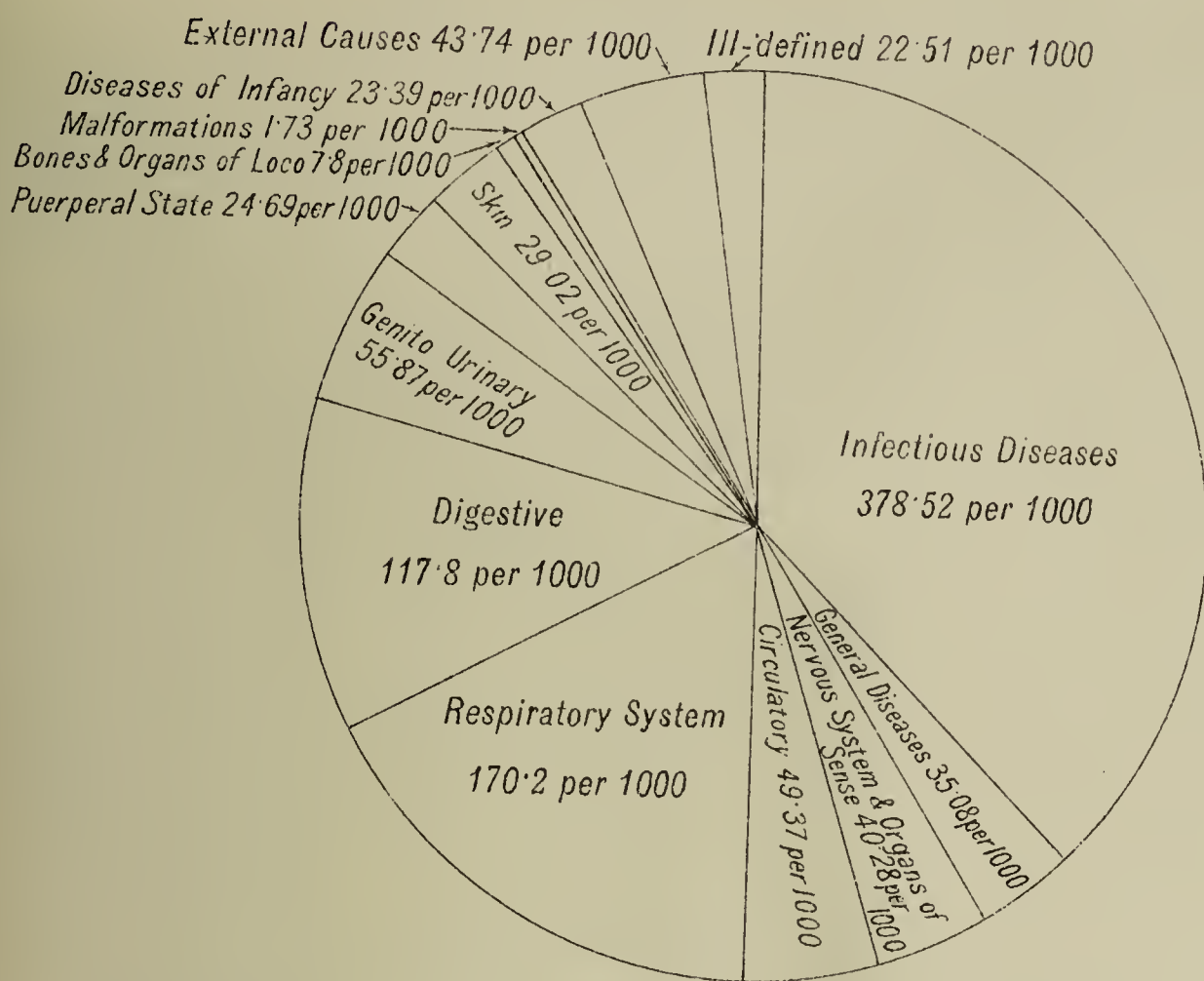
INFECTIVE DISEASES
TREATED IN GOVERNMENT INSTITUTIONS
TOTAL CASES 143,501
1931



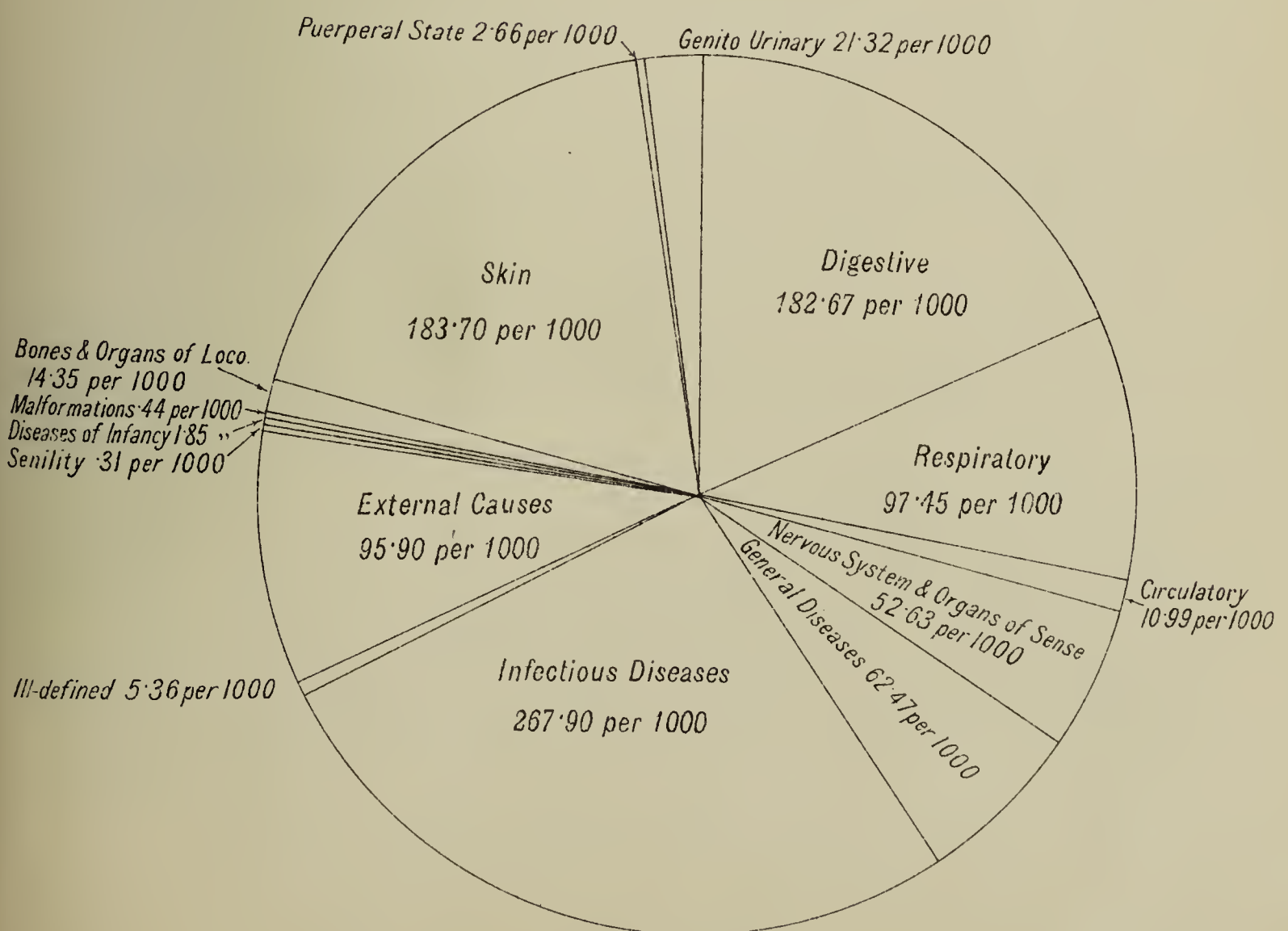
TOTAL DEATHS 946



COMPARATIVE DIAGRAMS
OF
DISEASE GROUPS
TREATED IN GOVERNMENT INSTITUTIONS
1930 & 1931



1930



1931

The fall in birth rate from 28.6 in 1930 to 24.6 per 1,000 of population in 1931 is partly accounted for by the higher population figure estimate following the census made in 1931. In 1930 the population was estimated at 122,000, whereas in 1931 it has been estimated at 140,000. Similarly the death rate per 1,000 has fallen from 16.5 in 1930 to 12.6 in 1931, but that this is not due entirely to the higher estimate of population is shown by the fact that the total deaths recorded in 1931 are only 1,776 as compared with 2,015 in 1930.

The calculation of infant mortality rate per 1,000 births is not affected by the higher estimate of population and again shows a satisfactory decline. The following summary enables comparison to be made with previous years of birth, death and infant mortality rates:—

Year.	Total Births.	Birth Rate.	Total Deaths.	Death Rate.	Infant Mortality.
1909	2,576	42.4	2,259	37.2	315
1919	2,517	30.2	2,256	27.0	296
1927	3,305	28.9	2,312	20.2	174.9
1928	3,330	28.1	2,439	20.5	138.1
1929	3,451	28.2	2,141	17.5	134.1
1930	3,494	28.6	2,016	16.5	129.07
1931	3,451	24.6	1,776	12.6	111.8

(2) GENERAL POPULATION—EUROPEAN.

The following table shows the estimated European population during the years 1929, 1930 and 1931:—

				Totals.
1929.				
Remaining on 31/12/29	...	...		7,056
Deaths during 1929	...	...		33
1930.				
Remaining on 31/12/30	...	...		8,249
Deaths during 1930	...	...		30
1931.				
Remaining on 31/12/31	...	...		4,882*
Deaths during 1931	...	...		38

* For previous years the total population was compiled from figures supplied by the Immigration Officer. For 1931 figures were obtained from the Government Statistician.

EUROPEAN NON-OFFICIALS.

CAUSES OF INVALIDING AND DEATHS.

According to Government returns for the year 1931, 59 European non-officials were invalided as compared with 54 in 1930:—

Anæmia, 1; bubo, 1; amœbic dysentery, 3; blackwater fever, 2; compound fracture, 1; colitis, 1; pleurisy, 1; smallpox, 1; tumour of lower spine, 1; pulmonary tuberculosis, 1; mitral stenosis, 1; neurasthenia, 10; diabetes, 1; appendicitis, 3; gangrene foot, 1; osteo myelitis, 1; phthisis pulmonalis, 1; aortic regurgitation, 1; pancreatic calculus, 1; sub-acute-mania, 1; influenza, 1; arterio-sclerosis, 1; gastric ulcer, 1; paralysis, 2; malaria, 6; hysteria, 2; renal calculus, 1; septicæmia, 2; hæmaturia, 1; rubeola, 1; carcinoma stasis, 1; intestinal stasis, 1; Raynaud's disease, 1; asthenia, 1; pyelitis, 1; arthritis, 1; inguinal adenitis, 1.

The number of deaths among European non-officials was 21 as compared with 17 in 1930. This in spite of the fact that the number of Europeans had declined. The cause of death was given as follows :—

Fatty heart, 1; cerebral hæmorrhage, 1; suicide, 2; yellow fever, 1; malaria, 1; pulmonary tuberculosis, 1; pulmonary hæmorrhage, 1; dilatation of heart, 1; typhoid fever, 1; accident, 1; hepatic thenia, 10; diabetes, 1; appendicitis, 3; gangrene foot, 1; osteo-myelitis, abscess, 1; *blackwater fever, 5; septic endocarditis, 1; cardiac failure, 1; enteritis, 1; murder, 1.

(3) EUROPEAN OFFICIALS.

TABLE SHOWING SICK, INVALIDING AND DEATH RATES OF EUROPEAN OFFICIALS FOR 1929, 1930 AND 1931.

	1929.	1930.	1931.
Total number resident	2,914	2,895	2,144
Average number resident	2,581	2,649	1,581
Total number on sick list	1,550	1,630	1,664
Total number of days on sick list	12,430	12,567	12,579
Average daily sick	34·05	34·4	34·4
Percentage of daily sick to average number resident ...	1·3	1·2	2·1
Average number of days on sick list to each patient ...	8·02	7·7	7·5
Average sick time to each resident	4·2	4·3	5·8
Total number invalided	207	192	168
Percentage of invalided to number resident	7·1	6·6	7·8
Percentage of invalided to average number resident ...	8·02	7·8	10·6
Total deaths	15	13	17
Percentage of deaths to number resident... ..	·51	·44	·79
Percentage of deaths to average resident	·58	·49	1·07

INVALIDINGS AND DEATHS.

	Invalidings.	Deaths.
Typhoid fever	—	1
Malaria	20	—
Blackwater	2	3
Influenza	1	—
Dysentery (amœbic)	3	—
„ (undefined)	1	—
Yellow fever	—	3
Dengue	1	—
Tetanus	—	1
Tuberculosis lungs	1	—
Tumours non-classified	4	—
Anæmia	8	—
Alcoholism	3	—
Auto-intoxication	1	—
Locomotor ataxia	1	—
Apoplexy	—	1
Embolism	—	1
Hemiplegia	1	—
Mental alienation	6	—
Carried forward	53	10

* Four cases treated as out-patients not included in Hospital statistics.

INVALIDINGS AND DEATHS—*continued.*

					Invalidings.	Deaths.
Brought forward					53	10
Epilepsy	...	...	...	...	2	—
Neuritis	...	...	...	...	3	—
Neurasthenia	...	...	...	...	26	—
Other affection of nervous system	...	...	...	...	2	—
Cataract	...	...	...	...	1	—
Conjunctivitis	...	...	...	...	1	—
Other affections of eye	...	...	...	...	2	—
Valvular diseases heart	...	...	...	...	1	—
Myocarditis	...	...	...	...	1	—
Acute endocarditis	...	...	...	...	—	1
Other diseases of heart	...	...	...	...	1	(heart failure) 1
Arterio-sclerosis	...	...	...	...	2	—
Thrombosis	...	...	...	...	1	—
Laryngitis	...	...	...	...	1	—
Broncho-pneumonia	...	...	...	...	1	—
Pneumonia	...	...	...	...	1	—
Pleurisy	...	...	...	...	1	—
Congestion of lungs	...	...	...	...	1	—
Ulcer of duodenum	...	...	...	...	1	—
Gastritis	...	...	...	...	6	—
Dyspepsia	...	...	...	...	4	—
Diarrhœa	...	...	...	...	3	—
Colitis	...	...	...	...	2	—
Appendicitis	...	...	...	...	2	—
Intestinal obstruction	...	...	...	...	—	1
Hernia	...	...	...	...	1	—
Hepatitis	...	...	...	...	1	—
Cholecystitis	...	...	...	...	1	—
Jaundice	...	...	...	...	2	—
Glycosuria	...	...	...	...	1	1
Pyelitis	...	...	...	...	2	—
Cystitis	...	...	...	...	1	—
Hydrocele	...	...	...	...	1	—
Boils	...	...	...	...	2	—
Carbuncle	...	...	...	...	1	—
Filariasis	...	...	...	...	1	—
Other diseases skin	...	...	...	...	1	—
Athritis	...	...	...	...	2	—
Synovitis	...	...	...	...	1	—
Suicide by firearms	...	...	...	...	—	2
Fracture	...	...	...	...	2	—
Tropical debility	...	...	...	...	19	—
Insomnia	...	...	...	...	4	—
Sudden death (cause unknown)	...	...	...	...	—	1
Asthenia	...	...	...	...	6	—
Total					168	17

RECAPITULATION BY COMPLETED MONTHS OF SERVICE.

Leave conditions.			Under 6 months.	Under 9 months.	Under 12 months.	Under 15 months.	Under 18 months.	Over 18 months.	Total.
New	...	...	11	13	7	49	71	8	159
Old	...	...	3	2	3	1	—	—	9
Strength of officers under new leave conditions			...	...	...	...	...	1,916	
" " " " old " "			...	...	...	...	...	228	

SUMMARY OF THE CAUSES OF INVALIDINGS AND DEATHS OF
AFRICAN OFFICIALS, 1931.

	Invalidings.	Deaths.
Abscess in brain	—	1
Angina pectoris	—	1
Arthritis	1	—
Atrophy of the optic nerve	1	—
Bronchitis (chronic)	1	—
Carbuncle	—	1
Carcinoma of stomach	1	—
Cardiac diseases	4	1
Cerebral abscess	—	1
Cerebral hæmorrhage	—	2
Cerebral thrombosis	—	1
Cerebro-spinal syphilis	1	—
Choroiditis progressive bilateral	1	—
Cirrhosis of liver	2	—
Defective vision	2	—
Delusional insanity	1	—
Diabetes mellitus	2	—
Double cataract	1	—
Dysentery (amœbic and bacillary)	—	2
Epilepsy	2	—
Goitre	1	—
Fatty heart	1	—
Gastritis (chronic)	1	—
Gastro-enteritis	—	2
Hepatitis	1	—
Hernia	1	—
Leprosy	1	—
Meningitis	—	1
Mental alienation, etc.	4	—
Myelitis	—	1
Myocarditis	5	—
Myopia	1	—
Nephritis acute	1	—
Oedema	—	1
Osteo-myelitis (chronic)	1	—
Paresis of right side	1	—
Pneumonia-lobar	—	7
Sarcoma of neck	1	—
Sclerosis and arterio-sclerosis	4	1
Senility	4	—
Septicæmia (acute)	—	1
Syphilis	—	1
Tetanus	—	1
Tuberculosis, pulmonary	7	3
Typhoid	—	2
Ulcerative colitis	—	1
Stricture of urethra	1	—
Total	56	32

SOLDIERS—NIGERIA REGIMENT—R.W.A.F.F.

SOLDIERS—NIGERIA.

Average daily strength	3,223
Total number on sick list	3,961
Total number of days on sick list	25,001
Average daily sick	10.8
Total number of deaths	33
Death rate per thousand	10.2
Number invalided during the year	69

During 1930 the number of deaths was 26, and the death rate per thousand was 8.4.

POLICE FORCE—NIGERIA.

Average daily strength	...	...	3,645
Total number on sick list	...	...	3,237
Total number of days on sick list	...	...	16,945
Average daily sick	...	...	8.8
Total number of deaths	...	...	17
Death rate per thousand	...	...	4.6
Number invalided during the year	...	...	25

During 1930 the number of deaths was 38, and the death rate per thousand was 10.4.

During the year a request was received from the Department of Biostatistics of the London School of Hygiene that vital statistics from the Colonies should be rendered upon a standardised scheme. Owing to the absence of compulsory registration in Nigeria, except in Lagos, the statistics can only be given for Europeans and whites for the whole of Nigeria and for Africans and non-Europeans for the Lagos area. The following tables, numbered according to the type scheme, are submitted:—

TABLES IV AND V.

BIRTHS AND BIRTH RATES AND STILLBIRTH.

	PROVINCE OR DISTRICT.	
	Whole of Nigeria.	Lagos Area.
ESTIMATED POPULATION.		
Europeans and whites	4,882	1,209
Other non-natives and Africans	20,762,000	140,060
LIVE BIRTHS.		
<i>Europeans and Whites:—</i>		
Male	12	4
Female	6	3
Total	18	7
Rate per 1,000 population	—	5.8
<i>Other Non-Natives and Africans:—</i>		
Male	—	1,752
Female	—	1,699
Total	—	3,451
Rate per 1,000 population	—	24.6
STILLBIRTHS.		
<i>Other Non-Natives and Africans:—</i>		
Male	—	30
Female	—	36
Total	—	66
Rate per 1,000 population	—	.47
1 Syrian (Female)		

TABLE VII.
DEATHS AND DEATH RATES.

	PROVINCE OR DISTRICT.			
	Whole of Nigeria.	Southern Provinces.	Northern Provinces.	Lagos Area.
DEATHS.				
<i>Europeans and Whites:—</i>				
Male	33	14	8	11
Female	5	2	1	2
Total	38	16	9	13
Crude rate per 1,000 living ...	7·7	8·0	5·4	10·7
DEATHS.				
<i>Other Non-Natives and Africans:—</i>				
Male	—	—	—	1,011
Female	—	—	—	765
Total	—	—	—	1,776
Crude rate per 1,000 living ...	—	—	—	12·9

TABLE VIII.

CLASSIFIED CAUSES OF DEATH.

(a) *Europeans and whites (whole of Nigeria) and*
(b) *Other non-natives and Africans (Lagos area only).*

Cause of Death.	(a) EUROPEANS AND WHITES (Whole Nigeria).			(b) OTHER NON-NATIVES AND AFRICANS (Lagos Area).		
	M.	F.	Persons.	M.	F.	Persons.
1. Enteric group ...	1	...	1	1	...	1
2. Typhus ...	...	...	...	...	...	...
3. Relapsing fever ...	...	...	...	...	...	...
4. Undulant fever ...	...	...	...	...	...	...
5. Malaria ...	8	2	10	29	22	51
6. Smallpox ...	...	...	...	1	...	1
7. Measles ...	...	...	...	1	...	1
8. Scarlet fever ...	...	...	...	...	...	...
9. Whooping cough ...	...	...	...	3	4	7
10. Diptheria ...	...	...	...	...	...	...
11. Influenza ...	...	...	...	...	...	...
12. Cholera ...	...	...	...	...	...	...
13. Dysentery ...	2	...	2	12	5	17
14. Plague ...	...	...	...	1	4	5
15. Yellow fever ...	3	...	3	...	...	...
16. Leprosy ...	...	...	...	...	...	...
17. Erysipelas ...	...	...	...	...	...	...
Carried forward ...	14	2	16	48	35	83

TABLE VIII.

CLASSIFIED CAUSES OF DEATH—*continued.*

Cause of Death.	(a) EUROPEAN AND WHITES (Whole Nigeria).			(b) OTHER NON-NATIVES AND AFRICANS (Lagos Area).		
	M.	F.	Persons.	M.	F.	Persons.
Brought forward ...	14	2	16	48	35	83
18. Encephalitis lethargica ...	...	...	...	1	...	1
19. Meningococcal meningitis ...	...	...	...	2	1	3
20. Tuberculosis of respiratory system	2	...	2	88	44	132
21. Other tuberculous diseases	...	...	...	24	23	47
22. Other epidemic, endemic or infectious diseases	...	...	...	...	...	...
23. Cancer, malignant disease	...	...	...	9	12	21
24. Pellagra ...	...	...	...	...	...	...
25. Beri-beri ...	...	...	...	1	...	1
26. Rheumatic diseases ...	...	...	...	7	6	13
27. Diabetes ...	1	...	1	3	2	5
28. Cerebral hæmorrhage, etc.	1	1	2	26	10	36
29. Heart disease ...	5	1	6	44	29	73
30. Arterio-sclerosis ...	1	...	1	14	15	29
31. Bronchitis ...	...	...	...	34	31	65
32. Pneumonia (all forms) ...	...	...	...	108	82	190
33. Other respiratory diseases	...	...	...	37	23	60
34. Ulcer of stomach, duodenum, etc.	...	...	...	14	10	24
35. Diarrhœa, etc.—						
(a) Under two years ...	...	...	...	25	17	42
(b) Two years and over	1	...	1	37	31	68
36. Sprue ...	...	...	...	...	...	...
37. Ankylostomiasis ...	...	...	...	...	2	2
38. Intestinal parasites ...	...	...	...	2	5	7
39. Appendicitis ...	...	...	...	2	4	6
40. Cirrhosis of liver	...	...	...	11	6	17
41. Acute and chronic nephritis	...	...	...	46	16	62
42. Venereal affections ...	...	...	...	33	1	34
43. Puerperal sepsis ...	...	...	...	...	3	3
44. Other accidents and diseases of pregnancy	...	...	...	...	27	27
45. Congenital debility malformation, premature birth, etc.	...	...	...	103	83	186
46. Suicide ...	3	1	4	3	...	3
47. Other forms of violence	4	...	4	50	17	67
48. Other defined diseases ...	1	...	1	150	89	239
49. Senility ...	...	...	...	67	124	191
50. Unknown or ill-defined ...	...	...	...	22	17	39
Total ...	33	5	38	1,011	765	1,776

TABLE IX.
CAUSES OF DEATH BY SEX AND AGE-PERIODS.
OTHER NON-NATIVE AND AFRICANS, LAGOS AREA ONLY.

Ages at Death.	All Causes.		SPECIFIC CAUSES OF DEATH.													
	Enteric Group.		Malaria.		Desentery.		Tuberculosis of Respiratory System.		Other Tuberculous disease.		Cancer Malignant.		Pneumonia, all forms.			
	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.		
All ages* ...	1,011	765	1	...	28	22	12	4	87	44	23	23	9	12	108	83
0-1 ...	211	175	...	...	13	10	...	...	1	1	2	...	...	...	24	27
1-5 ...	106	93	...	...	10	9	...	...	3	3	3	6	...	...	20	23
5-10 ...	27	27	...	...	3	1	...	...	2	3	2	3	...	...	7	6
10-15 ...	30	22	...	...	...	...	...	...	3	2	2	3	1	...	2	4
15-25 ...	84	58	1	...	1	1	2	1	22	11	3	3	...	1	17	2
25-35 ...	147	79	...	...	...	1	3	3	34	11	5	5	2	1	11	8
35-45 ...	112	36	...	...	1	...	1	...	11	5	3	2	3	1	10	6
45-55 ...	81	40	...	...	...	...	2	...	6	4	1	...	2	4	8	1
55-65 ..	47	43	...	...	...	...	3	...	2	4	2	1	...	2	4	4
65-75 ...	73	51	...	...	...	...	1	...	2	...	...	...	1	3	4	2
75 and over	93	141	...	...	...	...	...	...	1	...	...	...	...	...	1	...

*=Total.

TABLE X.

SEASONAL INCIDENCE OF MORTALITY DEATHS.

Month.	DEATHS.					
	EUROPEANS AND WHITES (Whole of Nigeria).			OTHER NON-NATIVES AND AFRICANS (Lagos Area).		
	M.	F.	Total.	M.	F.	Total.
January... ..	6	...	6	96	56	152
February	1	...	1	79	61	140
March	2	...	2	86	53	139
April	3	2	5	73	76	149
May	3	...	3	93	76	169
June	3	...	3	84	71	155
July ... ..	...	1	1	105	60	165
August	5	...	5	103	75	178
September	2	1	3	72	60	132
October	3	...	3	81	60	141
November	3	...	3	83	53	136
December	2	1	3	56	64	120
Total	33	5	38	1,011	765	1,776

III.—HYGIENE AND SANITATION.

A.—GENERAL REVIEW OF WORK DONE AND PROGRESS MADE.

I.—PREVENTIVE MEASURES.

(i) *Mosquito and insect borne diseases.*

(a) *Malaria*.—General anti-malaria measures have been carried out during the year throughout the entire country particularly in Lagos, Abeokuta, Ibadan and Port Harcourt where this work has been done on a large scale.

Reclamation, draining, maintenance of ditches and the clearing of bush combined with the use of larvicides such as paris green and fuel oil have been the means adopted against mosquito breeding. Mr. J. Y. Brown, European sanitary inspector, engaged on anti-malaria work in Lagos, who had the privilege of working with Dr. Barber, of the Rockefeller Foundation, carried out some interesting work in which he infected freshly-bred anopheles mosquitoes—unblooded insects—with malaria parasites by causing them to feed on male children known by previous examination to be carriers.

This work was undertaken with the view to supplying the Ministry of Health with occasional batches of infected mosquitoes in order to introduce into England the Nigerian strain of subtertian and quartan malaria for use in the malaria therapy of general paralysis.

. First of all many children and infants were examined before a suitable number of carriers with sufficient gametocytes could be found. The donors were voluntary, only male children being used.

The transportation of the infected mosquitoes in a living state to England was not very satisfactory in spite of much attention being paid to them as only very few—7 out of 99—survived the journey.

These experiments provided the important information that the malaria index of school children of the age group five to eight years showed a positive percentage of 58.5, while in infants three to four

months old the index was 14.7 per cent. A mosquito survey was recently made of the Railway Reservation at Ebute Metta the result of which showed that the predominating type of mosquito in this area is *Mansonioides Africanus*, and very few anopheline breeding places were found. The medical officer of health, Abeokuta, in his report states that Abeokuta is an endemic area, malignant tertian and quartan being the two strains of malaria present and benign tertian being practically absent; the incidence of infection in the population of Abeokuta is reported to be 91 per cent.

In the Northern Provinces anti-malaria measures progressed in the larger Native Administration areas and included the demonstration of the mosquito and its habits to district heads, etc., by Native Administration sanitary inspectors.

The Medical Officer of Health, Lagos, in his annual report for 1931, states that an experiment was carried out on a pond in Yaba with a view to discovering whether paris green was effectively larvicidal to culicines as well as anophelines. The pond was carefully inspected every morning. Culicine and anopheline larvæ were plentiful before paris green was applied; no anopheline pupæ or mature anopheline larvæ were detected for six days after the paris green dusting had taken place, but culicine pupæ were recovered from every daily collection. There seemed to be some diminution in the fully grown culicine larvæ after the application of paris green, but this larvicide certainly failed to effect a complete culicine kill.

The undermentioned figures give the result of routine house-to-house inspections in Lagos by sanitary inspectors showing the total number of compounds, rooms, outhouses, domestic water containers and canoes, examined during the year. The total number of mosquito breeding foci is indicated and also the mosquito larvæ index in each case:—

			<i>Inspected.</i>	<i>Foci.</i>	<i>Index.</i>
Compounds	...	...	252,610	3,341	1.3
Rooms	...	...	707,745	260	.03
Outhouses	...	...	264,253	277	.1
Domestic water containers			644,507	4,286	.6
Canoes	...	...	1,909	16	.8

Dr. Barber, of the Rockefeller Foundation, in his report summarises the malaria problem in Lagos as follows:—

- (1) The parasite rate of children is high and infection continues at the present time.
- (2) The anopheline intensity of the town of Lagos (at least the north-west area) is low, but the sporozoite rate of anophelines collected in houses is high and adequate to keep up a high malaria rate.
- (3) Lagos is surrounded by swamps immediately adjacent to the town on the east side and separated by only $\frac{1}{2}$ a mile of water on the west and north coast. These swamps are near the level of the lagoon and productive of *anopheles gambiæ* whether the water is fresh or brackish.
- (4) In or near these swamps are African villages where *anopheles* may become infected before they disperse.
- (5) It is practically certain that *anopheles gambiæ* may disperse over half a mile, probably further, and it is probable that they come into Lagos from across the lagoon.
- (6) Anopheline breeding is going on within the town itself. Dr. Barber concludes his report with the following remarks:—“In Southern Nigeria we deal with a population nearly saturated with malaria and with a

species of anopheles very susceptible to infection, very domestic in its habits and very adaptive to various sorts of breeding places. We cannot then expect here the spectacular results which have been reported of 'campaigns' in other regions but may have to depend on slow but purposeful measures''.

Yellow Fever.—During the year eight cases occurred in Europeans, four of which were fatal, and nine cases were diagnosed in Africans :—

(a) 13 cases were reported from the Mamfe division of the Cameroons Province; four cases with two deaths in Europeans and nine cases in Africans all non-fatal. The diagnosis of the African cases was rendered difficult by the presence of an epidemic of influenza at the time. The serum of ten of the suspected cases was tested by the protection test and of these seven proved to be positive.

(b) One fatal European case occurred at Abakaliki, in the Ogoja Province, and one European succumbed to the disease in Lagos. This latter case was an imported one as far as Lagos was concerned, because the patient arrived from the Northern Provinces proceeding on leave, and on arrival at Lagos was taken to the European hospital where he died two days after admission. In this case the probable place of infection was Garkida, in the Adamawa Province.

(c) Two cases occurred in the Northern Provinces, both Europeans, one of which was fatal. The one lived at Kakuri, which is five miles south of Kaduna North, and the other lived in Kaduna and fell ill four days after his return from Baro, where he had been on tour. The latter case which was not fatal was proved to be positive by the protection test carried out by the Rockefeller Yellow Fever Commission.

Energetic anti-mosquito measures were carried out in the places where cases of yellow fever occurred.

The protection test surveys of the West African Yellow Fever Commission, made with a view to more accurately defining the endemic, epidemic, and free areas of yellow fever in West Africa, were intensified in South-western Nigeria, where much work had previously been done, and were extended more or less generally throughout the Protectorate and to a limited extent to other colonies. This was made possible through the development of the mouse protection test which has now replaced the more cumbersome and costly tests with monkeys and with which a total of approximately 1,700 sera collected from 61 centres, mainly in Nigeria, was examined during the year. Though much work remains to be done in Nigeria before conclusive results on the territory as a whole can be reached, some findings secured to date are of great interest and importance. These have demonstrated that yellow fever has been far more prevalent and widespread in West Africa than was previously supposed, and that the infection has invaded practically all parts of Nigeria and has reached at least as far as its northern boundary, probably in epidemic form, as indicated by the following percentages of positive sera :—

Katsina :	Children	25	Sera	Positive	0
	Adults	25	„	„	24
Kano :	Children	50	„	„	6
	Adults	25	„	„	25
Zaria :	Children	54	„	„	2
	Adults	25	„	„	12
Gadau	Children	23	„	„	9
area :	Adults	25	„	„	16

Only in the elevated region of the Jos Plateau have characteristically negative sera been obtained. The positive findings in adults and children in all cities studied in South-western Nigeria, some of which are given below, have demonstrated the existence of regional endemicity, but the limits of the endemic area have not yet been established.

					%
Ibadan:	Children	115	Sera	Positive	35
	Adults	72	„	„	38
Abeokuta:	Children	50	„	„	54
Ogbomosho:	Children	75	„	„	11
	Adults	50	„	„	66
Jebba:	Children	25	„	„	28

Passing eastward, the figures are lower and negative results in children suggest freedom from endemicity and from epidemics during recent years.

					%
Akure:	Children	25	Sera	Positive	0
	Adults	25	„	„	12
Owo:	Children	25	„	„	6
	Adults	25	„	„	12
Ilesha	Children	25	„	„	4
Onitsha:	Children	30	„	„	0
	Adults	25	„	„	36
Owerri	Children	39	„	„	0
Okigwi:	Adults	80	„	„	16

Studies in the Benue area where yellow fever was reported in 1917 and one case was observed in 1928 show that yellow fever has been exceedingly prevalent there and great numbers of cases have occurred. A survey in five towns gave negative results in one and from 20 to 35 per cent of positive sera in four others.

Sera taken at random from children in Mamfe, where an epidemic of yellow fever occurred in 1931, gave 50 per cent positive.

Eleven sera obtained in a Gwari village near Kakuri, where a fatal case occurred in a European in the autumn of 1931, gave 100 per cent positive.

The protection test has proved exceedingly valuable in confirming or negating the diagnosis of yellow fever in numerous obscure febrile conditions associated with jaundice observed during the year.

The West African Yellow Fever Commission of the Rockefeller Foundation made an *ædes* survey in Ibadan, Zaria and Kano during 1931 with the following results.

These figures are included in this report with the kind consent of the Director of the Yellow Fever Commission, Dr. Beeuwkes.

Town.		No. of houses inspected.		Total foci.		House larvæ index % <i>ædes</i> <i>ægypti</i> .	
		D.S.	W.S.	D.S.	W.S.	D.S.	W.S.
Ibadan	...	302	102	499	265	64.9	79.4
Zaria	...	100	100	101	293	45	69
Kano	...	100	100	36	76	24	34

TOWN.	No. of Rooms Inspected.		Total No. of adult Mosquitoes caught.		Percentage of <i>ædes ægypti</i> caught.	
	D.S.	W.S.	D.S.	W.S.	D.S.	W.S.
Ibadan.	1,588	487	4,792	2,402	58·7*	29·6
Zaria	544	485	370	2,113	60·3	18·7
Kano	532	426	263	1,480	50·2	11·6

D. S. denotes Dry Season.

W. S. denotes Wet Season.

* Period after cessation of Harmattan.

This work is incomplete and it is intended to make a further survey during the next Harmattan season.

During the year outbreaks of yellow fever were reported from the following places outside Nigeria:—Gold Coast, 19 cases; French West Africa, 31 cases.

Relapsing Fever.—During the year 78 cases of relapsing fever were reported with five deaths. All the cases occurred in the Northern Provinces none having been reported from the south. The outbreak occurred during the first quarter of the year and was in close proximity to the French boundary in the Kano Province.

Infected persons were medically treated and delousing posts were established at different points in the affected area for the disinfection of clothing and to prevent as far as possible the spread of the disease.

(ii) EPIDEMIC DISEASES.

Plague shows a marked decrease as compared with former years. There were five cases of plague with five deaths in Lagos during 1931; the last case occurred on the 23rd of April, and the incidence of the disease was as follows:—

One case in January.

One case in February.

Three cases in April.

One case was of the pneumonic type, one of the septicæmic type, and three were bubonic. All five cases were diagnosed post-mortem.

The following table shows the incidence of plague in the last seven years:—

Year.	No. of Cases.	No. of Deaths.	Case Mortality.
1925	104	88	84·6%
1926	497	476	95·8%
1927	155	151	97·4%
1928	519	509	98·0%
1929	188	176	93·6%
1930	65	66	100·0%
1931	5	5	100 0%

Vigorous anti-plague measures were carried out during the year. The whole of Lagos has been dealt with by the Medical Officer of Health and his staff, deratting and rat-proofing measures having been assiduously carried out.

Deratting and the other usual anti-plague measures were also carried out in the larger outlying towns in the Ijebu Ode Province and also in the towns of Abeokuta, Ibadan and Port Harcourt. Six infected rats were found in Lagos town during the year in course of anti-plague operations.

In the course of anti-plague operations large numbers of rodents were caught and examined as shown in the following table :—

			Rodents caught.	Rodents Examined.	Rats Infected.
Lagos	...	...	86,664	47,884	6
Abeokuta	...	...	63,784	33,289	—
Ibadan	...	...	16,087	11,148	—
Ijebu Ode	...	...	37,651	36,785	—
Port Harcourt	...	...	19,665	18,565	—

Supervision of canoe as well as of road and railway traffic was carried out during the year.

No case of plague was reported from the Mainland.

Smallpox, and Vaccination.—Smallpox is endemic throughout Nigeria. During the year under review 1,656 cases and 395 deaths were reported in the Southern Provinces and 659 cases with 173 deaths were reported from the Northern Provinces.

There were a number of comparatively small outbreaks of this disease in the Northern Provinces and they were dealt with by vaccination campaigns by medical officers, sanitary inspectors and vaccinators. The principal outbreaks occurred at Zuru, Idoma Division, Azare, Bida, Yola and Maiduguri.

Three cases of smallpox were recorded in Lagos during the year. 30,424 vaccinations were carried out in Lagos 73.05 per cent of which were successful.

The vaccination campaigns conducted in certain districts in Calabar and Owerri Provinces during 1930 have apparently had a good effect because there has been a considerable diminution in the number of cases of smallpox in these areas during 1931. A few cases did occur in the Owerri region in January and for the first three months of the year under review, cases continued to appear in the Eket-Opobo districts, but with the exception of three cases in the Opobo area in September no further reports of this disease have been received from these centres.

The only epidemic worthy of special mention occurred in the Ogoja Division during September, October and November in which period 652 cases of smallpox with 177 deaths occurred. Consequent on intensive vaccination there was a marked diminution of the disease.

The vaccinations carried out in the Southern Provinces are reported as follows :—

Total vaccinations	...	...	488,770
Number inspected for results	...	...	399,883
Number successful	...	...	331,153
Percentage successful	...	...	82.81 %

The vaccination figure reported from the Northern Provinces are as follows :—

Total vaccinations	...	...	50,196
Number successful	...	...	29,362
Percentage successful	...	...	58.4 %

Enteric Fever.—In Lagos four cases with two deaths were recorded during the year one of the fatal cases occurring in an European.

Search for the source of infection proved negative in the first two cases; both occurred in March and gave a positive Widal reaction.

Case 3 occurred in November and was diagnosed post-mortem. This was an inmate of the Boy's Industrial House at Yaba, and while investigating this case the fourth was discovered, also an inmate of the home, who was found to be a carrier after the bloods of the 45 inmates had been tested by agglutination.

In the Southern Provinces three cases of fevers in the enteric group were reported, one in Warri and two in Ibadan. In the Northern Provinces one case was reported.

Cerebro-Spinal Fever.—18 cases with ten deaths were reported from the Northern Provinces.

There was no epidemic of the disease during the year in the Southern Provinces.

Two cases with two deaths were reported in Lagos.

A new Infectious Diseases Hospital was erected at Ibadan and was taken over on the 31st of March, 1931. It is modelled on the country type plan and has ample room for extension. The present accommodation consists of two wards with concrete floor, block walls and pan roofs which is sufficient for 24 patients.

II.—GENERAL MEASURES.

(a) *Sewage Disposal.*—Very little can be added to what has been stated in previous annual reports.

Septic tank installations are now in use in a number of premises in Ikoyi and Lagos and are proving satisfactory.

The general methods of night soil disposal remain the same, bucket latrines being used in the township and in other areas where funds permit of this system. Where the bucket latrine is not adopted ordinary pit latrines either with or without a fuming chamber are used.

The smoke pits latrine has been found to work quite satisfactorily especially in reducing the number of flies which are usually so prevalent in native latrines.

(b) *Scavenging and Refuse Disposal.*—37,745 tons of refuse were burnt in the Lagos destructor during 1931. The various incinerators built by sanitary labour in Ebute Metta have been maintained and have satisfactorily disposed of 4,269 tons of refuse during the year.

The tin press at the refuse destructor is working and has effected a great improvement in the quality of the residue left for final disposal by dumping.

The scrap metal produced by the press has proved to be very useful for minor sanitary improvements.

Incineration of refuse is carried out in all townships and non-combustible refuse is buried.

(c) *Drainage and Reclamation.*—Reclamation of various swampy areas by means of ashes obtained by burning refuse has been continued in Lagos and Ebute Metta. The Lagos Executive Development Board has improved the Idumagbo area very considerably by reclamation and so has converted one of the most unsanitary areas in Lagos into a sanitary one.

Few permanent drains have been constructed but labour gangs have been employed in cutting new and clearing old earth ditches.

(*d*) *Water Supply*.—Water supplied to Lagos and environs from Iju has been of very good quality as shown by the results of routine bacteriological examination. A new scheme for the improvement of the Port Harcourt water supply has been prepared. This embraces the provision of three tubular wells, aeration plant, sedimentation and clear water tanks.

The Kano Native Administration scheme has been completed, but the bacteriological examination of the water shows it will require chlorination.

With regard to the provision of water supplies in certain towns in Nigeria action has been taken in that investigations have been commenced in some places and extended in others.

(*a*) *Benin*.—Investigations have been extended and an alternative and more economical scheme has been prepared which is to be commenced in 1932.

(*b*) *Ibadan*.—Preliminary plans are being prepared and report is to be submitted.

(*c*) *Zaria*.—Preliminary investigations were carried out but nothing further has been done through lack of staff in the Public Works Department.

(*d*) *Okene*.—Further investigations are to be carried out in the near future.

(*e*) *Oshogbo*.—The Native Administration engineer has been engaged on this work and will submit an alternative scheme to that prepared by the Public Works Department.

(*f*) *Abeokuta*.—A scheme for a water supply in conjunction with one for electrical development was submitted but on account of financial stringency the joint proposals were deferred and a reduced separate waterworks scheme was ultimately prepared and submitted to Government.

(*g*) *Calabar*.—Investigations will be commenced in 1932.

(*h*) *Port Harcourt*.—Investigations were commenced during the year.

OTHER SCHEMES.

(*a*) *Ilorin*.—A small scheme to cost £4,000 was prepared but has been deferred owing to the need for economy.

(*b*) *Ife*.—A scheme suggested by the Native Administration engineer has been submitted and is under consideration.

(*c*) *Iseyin*.—A scheme by the Native Administration Engineer has been submitted for consideration.

Lagos Water Supply.—Aeration and Chemical treatment plant were put into operation successfully.

Complete Water Schemes being maintained.—Lagos, Kaduna, Lokoja, Makurdi, Kano, Onitsha, Enugu.

Partial supplies maintained.—Benin, Abeokuta, Calabar, Port Harcourt, Moor Plantation (Ibadan), Ogunpa (Ibadan).

Offensive Trades.—The hide and skin industry is practically confined to the Northern Provinces in which the Public Health Ordinance has been made applicable to the majority of stations where this industry is carried out.

In the Southern Provinces no offensive trades are carried on on a large scale.

Clearance of bush and undergrowth has been carried out in all stations as far as funds permitted particularly in connection with anti-yellow fever work.

Sanitary Inspections.—Most of the large towns were inspected by the Deputy Director of Health Service or the Senior Health Officer of the Northern and Southern Provinces.

Inspections under the Public Health Ordinance have been continued by the European and African Sanitary Inspectors throughout the year. In Lagos and district 8,995 abatement notices were issued of which 6,131 were complied with.

III.—SCHOOL HYGIENE.

School premises throughout the country were inspected by the sanitary staff as a routine measure and in the larger centres medical inspection of school children has been carried out:—

(a) In Lagos 762 boys and 263 school girls were medically inspected. This total of 1,025 scholars was made up from five schools.

The following defects were detected:—

(a)	Enlarged cervical glands in	212	children.	
(b)	Enlarged spleen	389	„	
(c)	Defective vision	69	„	
(d)	Eye disease	38	„	
(e)	Abnormal urine	170	„	
(f)	Parasites in stools of	806	„	
(g)	Tinea of body and scalp	221	„	
(h)	Non-vaccinated	167	„	

School clinics were held at Ereko dispensary and in Broad Street, at which 3,246 attendances were made.

(b) In Port Harcourt two clinics were established one at the African hospital and one at the health office; 940 children were examined.

(c) In Ibadan 253 scholars were submitted to routine medical inspection.

IV.—LABOUR CONDITIONS.

There is no contract or indentured labour in Nigeria. The conditions under which labourers serve on the plantations in the Cameroons under British mandate continue to be satisfactory.

V.—HOUSING AND TOWN PLANNING.

There is a marked and steady improvement in the houses of the better classes and the development of the Yaba estate is very satisfactory.

The Idumagbo Lagoon area has been thoroughly investigated by officers of the Lagos Executive Development Board and plans have been drawn up for the improvement of the area.

Town re-planning is in progress in the Idumagbo and Oko Awo districts of Lagos where insanitary conditions are prevalent.

VI.—FOOD IN RELATION TO HEALTH AND DISEASE.

Routine inspection of foodstuff has been carried out. Animals intended for sale as meat for human consumption are examined both before and after slaughter.

The commonest conditions which made seizing and destruction of meat necessary were liver fluke, pleurisy pneumonia, cysticercus bovis.

Aerated Water Factories.—There were two factories at work in Lagos during the year.

Samples of their products were examined regularly and the results were quite satisfactory.

Bakehouses.—There were 50 registered bakehouses in Lagos during 1931, and their condition was satisfactory.

Bakehouses established in other towns were under constant supervision.

B.—MEASURES TAKEN TO SPREAD THE KNOWLEDGE OF HYGIENE AND SANITATION.

Elementary hygiene is taught in all Government assisted schools.

Health weeks were held in Lagos, Port Harcourt and Kano during the year with gratifying results.

C.—TRAINING OF SANITARY PERSONNEL.

Sanitary inspectors are now trained at Lagos and Kano. The school at Lagos has been established for some years and has trained many African inspectors.

The school at Kano is new and with the material available has done very good work.

It is hoped to establish a training school for sanitary inspectors at Ibadan with funds provided under the Colonial Development Fund.

In Lagos, health visitors are lectured to twice weekly by the sister in charge of infant welfare work.

One health visitor at a time is attached whenever possible for one month to Massey Street dispensary to acquire and keep up her training in the case of infants and in minor surgical nursing.

D.—RECOMMENDATION FOR FUTURE WORK.

1. Extension of water supplies in large towns.
2. Introduction of building bye-laws in the more important towns under Native Administration.
3. Extension of infant welfare and school medical inspection work.

VII.—PORT HEALTH WORK AND SANITATION.

Lagos still remains the principal port in Nigeria. The staff working at the port consists of:—

- One port health officer.
- Two European sanitary inspectors.
- One African sanitary inspector.
- One African sub-inspector of sanitation.
- One African female attendant.
- One African anti-mosquito inspector.
- One African vaccinator.
- One African 2nd class clerk.
- Six rat-catchers.
- Sixteen labourers and two headmen.

Regulations were made under the Quarantine Ordinance—Quarantine (Fees) Regulations, 1931—whereby fees could be charged for deratisation and deratisation (exemption) certificates.

Systematic deratting of vessels entering the port has continued throughout the year, and all rodents recovered were sent to the dissecting station for examination.

The following table shows the fumigation with Zyklon B and SO₂ carried out in the Port of Lagos during 1931 :—

Zyklon B ships	...	...	...	...	...	21
„ tugs	...	...	...	...	...	10
„ lighters	...	...	...	...	...	2
SO ₂ ships	...	...	...	...	...	—
„ tugs	...	...	...	...	...	2
„ lighters	...	...	...	...	...	52
Part Zyklon B						
Part SO ₂ ships	...	...	...	...	...	10
„ tugs	...	...	...	...	...	1
Total capacity fumigated	...	...	...	...	3,106,800	cubic feet.
Number of deratisation certificates issued	...	...	...	...	...	26
Number of deratisation (exemption) certificates issued	...	...	...	...	...	4

No case of infectious disease occurred on any ship entering Lagos during the year.

The strictest measures were maintained to limit mosquito breeding on the foreshores and on harbour craft; 9,100 craft inspections were made and mosquito larvæ were found on 51 occasions, giving an index of 0.56 per cent.

731 vessels entered the port during the year and 736 cleared.

Port Harcourt.—All vessels entering the port are inspected and all deck passengers are examined and vaccinated when necessary. 296 entered the port during the year. No case of infectious disease was discovered.

Calabar.—Vessels entering this port are boarded by the medical officer of health. No case of infectious disease was discovered.

G. C. M. DAVIES,
Acting Deputy Director of Health Service.

V.—MATERNITY AND CHILD WELFARE.

The following non-Government training centres were approved by the Midwives Board under the Midwives Ordinance as training centres for midwives:—Egba Native Administration Welfare Centre, Abeokuta, C.M.S. Maternity Hospital, Iyi Enu, Baptist Mission Hospital, Ogbomosho, Wesleyan Mission Hospital, Ilesha.

Six African pupils midwives satisfied the examiners appointed by the Midwives Board during the year and were granted the certificates of Grade I midwives after a period of two and a half years training.

At Lagos 440 in-patients and 9,850 out-patients were treated by the lady medical officer at the Massey Street Maternity Hospital. Of these cases 250 in-patients and 852 out-patients were treated in labour or during pregnancy. The lady medical officer also has charge of two wards for women and children at the African Hospital, Lagos.

The child welfare centres instituted by the Lagos Town Council have done excellent work during the year. Registration of births being compulsory in the Lagos area enables all mothers to be visited by the staff of ten African health visitors who work under the medical officer of health, and these visitors work in turn at the welfare centres and are used for “ follow up ” work and for ante-natal work.

The European nursing sister in charge also visits districts in rotation. The steadily increasing work which is carried out by the health visitors is shown by the table given below:—

	1927.	1928.	1929.	1930.	1931.
New cases visted for the year	2,818	3,287	3,426	3,490	3,452
Infants alive at first visit	2,661	3,121	3,258	3,360	3,332
Infants dead at first visit	139	124	134	120	115
Mothers alive at first visit	2,789	3,234	3,376	3,479	3,438
Mothers dead at first visit	11	11	16	11	9
Cases not found	18	42	34	10	5
Total visits and revisits for the year ...	10,057	21,357	23,393	27,563	32,309
Infants alive at revisits	7,215	17,936	19,588	23,765	28,560
Infants dead at revisits	144	134	279	308	297
Cases attended at birth by medical practitioners	694	890	784	870	851
Cases attended at birth by native medicine men	2,116	2,377	2,608	2,610	2,596
Cases induced to visit dispensaries	651	507	426	258	241

Infant welfare clinics are held three days a week at the Massey Street Hospital and one day at Ebute Metta, under the charge of a lady medical officer and nursing sister. During 1931, 2,249 cases were on the register, with a total of 5,352 attendances. A note was made that 1,499 mothers who attended were occupied in trading or crafts and 757 were occupied at home.

The steady decline of infant mortality in Lagos has been shown under Section II, Vital Statistics. The following are the causes of deaths certified for infants under one year:—

Malaria	...	...	...	...	23
Whooping cough	...	...	...	...	5
Tetanus	...	...	...	...	4
Tuberculosis (respiratory)	...	...	...	...	1
Syphillis	...	...	...	...	4
Purulent infection	...	...	...	...	4
Thymus disease	...	...	...	...	1
Cerebral hæmorrhage	...	...	...	...	1
Convulsions	...	...	...	...	59
Hiccough	...	...	...	...	1
Panophthalmitis	...	...	...	...	1
Bronchitis	...	...	...	...	33
Pneumonia	...	...	...	...	51
Inflammation of stomach	...	...	...	...	1
Colitis	...	...	...	...	1
Diarrhœa and enteritis	...	...	...	...	27
Peritonitis	...	...	...	...	1
Acute nephritis	...	...	...	...	2
Acute osteomyelitis	...	...	...	...	1
Congenital hypertrophic pyloric stenosis	...	...	...	...	1
Spinal bifida	...	...	...	...	1
Congenital debility	...	...	...	...	91
Premature birth	...	...	...	...	33
Injury at birth	...	...	...	...	11
Diseases of umbilicus	...	...	...	...	7
Atelectasis	...	...	...	...	8
Lack of care	...	...	...	...	1
Melæna	...	...	...	...	1
Burns	...	...	...	...	1
Ill-defined diseases	...	...	...	...	10
Total	...	...	...	...	<u>386</u>

At Abeokuta the Government section of the Sacred Heart Hospital is devoted to maternity work, and during the year 350 in-patients were admitted, of which 58 were cases of normal labour and 36 of abnormal labour. Eighteen cases of "native medicine" poisoning in infants were admitted of which nine died. There were 10,800 attendances at the out-patient department.

The infant welfare centre instituted by the Egba Native Administration at Abeokuta, under the care of Miss McCotter, continues to attract an immense number of mothers. The following figures indicate the work performed:—

New attendances	...	...	...	2,688
Average daily attendances	...	...	...	250
Total attendances	...	...	...	77,293
Ante-natal attendances	...	...	...	1,430

Four district visitors (African) are employed and four midwives and four welfare workers are under instruction. A sub-centre was opened at Idi-Aba district of the town, and a centre has been at work during the year at the town of Ilaro.

At Ijebu Ode a maternity ward was opened in August at the African hospital, providing a labour room and six beds. Twelve women were delivered during the year, and large number of ante-natal cases attended and a child welfare centre, controlled by the European nursing sister, is becoming increasingly popular.

At Ibadan a new ward for female patients was opened at the Native Administration hospital in the town. This ward includes a

labour room and bed. In the autumn a European nursing sister was posted to the hospital and a start has been made with child welfare work.

At Warri, Aba, Port Harcourt and Calabar an increasing amount of work is done each year for female patients and infants at the African hospital.

In the Northern Provinces the female work started at Katsina and Kano is making progress. The greatest difficulty is the training of the illiterate local women as nurses—it has not been possible as yet to commence training as midwives. There is, however, an increasing response to the efforts of the lady medical officer at Katsina and of the nursing sister at the Native Administration hospital at Kano. At Katsina much of the work carried out by the lady medical officer consists of house visiting and the people are intensely conservative. Increasing numbers are, however, attending at the hospital and seeing the lady medical officer during the visits she makes to compounds. The lady medical officer notes that the “purdah” women are in much better physical condition than the same class in India.

At Kano the women’s section of the Native Administration hospital in Kano city is becoming more and more popular and much good work is done by the nursing sister in charge by visiting the compounds of the Emir and high officials. Female sanitary inspectors are being trained to visit compounds where there are “purdah” women.

At Ilorin a plan to convert part of the Native Administration dispensary in the town into a maternity ward and training centre for midwives is being proceeded with under funds supplied by a grant from the Colonial Development Fund.

The medical missions throughout Nigeria carry out a considerable amount of maternity and child welfare work. A fine new maternity ward was opened at Iyi-Enu, near Onitsha, by the Church Missionary Society.

VI.—HOSPITALS AND DISPENSARIES.

The hospitals which are now being maintained are shown upon the map which accompanies this report. The table given below indicates their capacity and type. The African hospitals classed as “B” are used for training of African nursing staff under the supervision of European nursing sisters. Those classed as “E” are similarly used for training hospital dressers employed by Native Administrations. The group shown as “D” are partly bush hospitals of local construction but include some which have been improved or totally constructed by the building of simple but efficient wards, theatres, etc., of semi-permanent material, i.e., timber and asbestos sheeting or mud blocks faced with cement.

The table shows that 12 European hospitals, and one sick rest house, with 141 beds, and 54 African hospitals with 2,567 beds are being maintained.

A.—EUROPEAN HOSPITALS.

(a) Colony and Southern Provinces.

					<i>Beds in use.</i>
Lagos	...	...	...	...	30
Ibadan	...	...	...	...	14
Enugu	...	...	...	...	11
Port Harcourt	...	...	...	...	10
Calabar	...	...	...	...	8
Warri	...	...	...	...	8
Onitsha	...	...	...	...	4
Victoria	...	...	...	...	4
Forcados	...	...	...	...	4 Sick rest house only.

A.—EUROPEAN HOSPITALS—*continued.*(b) *Northern Provinces.**Beds in use.*

Jos	18
Kaduna	14
Kano	10
Lokoja	6
Total European beds ...	<u>141</u>

B.—AFRICAN HOSPITALS FULLY EQUIPPED AND TO WHICH EUROPEAN SISTERS ARE POSTED.

(a) *Colony and Southern Provinces.**Beds in use.*

Lagos	200	New hospital opened March, 1931.
Port Harcourt	170	
Calabar	107	
Abeokuta	96	
Ijebu Ode	62	Maternity ward opened in 1931.
Victoria	62	
Enugu	52	
Aba	42	
Onitsha	40	
Ibadan (Government hospital)	34	
Warri	30	

(b) *Northern Provinces.*

Kano (Fagge hospital)	138	
Jos	72	
Kaduna	72	
Zaria	70	New hospital opened in May, 1931.
Lokoja	41	

C.—AFRICAN HOSPITALS OF MODERN DESIGN BUT TO WHICH NO EUROPEAN SISTERS ARE POSTED.

(a) *Southern Provinces.**Beds in use.*

Oshogbo	35	
Benin	25	
Sapele	24	New operating theatre completed during year.
Agbor	22	

(b) *Northern Provinces.*

Minna	27	
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D.—AFRICAN HOSPITALS OF SIMPLE CONSTRUCTION.

(a) *Southern Provinces.**Beds in use.*

Banso	80	
Bamenda	62	
Ikot Ekpene	46	
Kumba	44	
Mamfe	44	
Akure	30	New country type hospital opened in 1931.
Buea	29	
Okigwi	27	New Native Administration hospital is under construction.

D.—AFRICAN HOSPITALS OF SIMPLE CONSTRUCTION—*continued.*(a) *Southern Provinces.**Beds in use.*

Degema	19	Dressing room, waiting room and kitchen added during year.
Ogoja	...	...	...	...	18	
Opobo	...	...	...	...	17	
Abakaliki	...	...	...	...	16	
Owerri	...	...	...	...	14	New Native Administration hospital is under construction.
Forcados	...	...	...	...	11	
Obubra	...	...	...	...	8	

(b) *Northern Provinces.*

Yola	...	...	...	...	36	
Bauchi	...	...	...	...	30	New country type hospital completed in 1931.
Gusau	...	...	...	...	25	This hospital is being taken over by the Native Administration.
Makurdi South	...	...	...	...	24	New permanent ward has been opened and new wards are being built by Native Administration.
Azare	...	...	...	...	22	
Kafanchan	...	...	...	...	22	
Lafia Beriberi	...	...	...	...	20	
Zuru	...	...	...	...	20	
Ibi	...	...	...	...	18	New hospital being constructed by Native Administration at Wukari to replace this.
Ankpa	...	...	...	...	16	

E.—AFRICAN HOSPITALS WHOLLY OR PARTLY BUILT AND MAINTAINED BY NATIVE ADMINISTRATIONS.

(a) *Southern Provinces.**Beds in use.*

Ibadan (Adeoyo Hospital)	...	61	New female ward opened in 1931.
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(b) *Northern Provinces.*

Maiduguri	80	
Sokoto	80	New Native Administration hospital nearing completion to replace bush hospital.
Kano city	...	...	...	78	
Katsina	...	...	...	67	
Bida	...	...	...	32	
Ilorin	...	...	...	22	
Pankshin	...	...	...	28	Opened December, 1931.

Total African beds ... 2,567

The above figures do not include beds provided at the maternity hospitals. At African hospitals, roughly, one-quarter of the total number of beds are reserved for female patients.

Extensions and improvements undertaken at hospitals during the year are indicated in the "remarks" column of the above table. The new African hospital at Lagos was officially opened in March. The fine two-story ward blocks, connected by a lift, provide accommodation for 200 patients. Electrically heated water is available and the electric sterilisers and disinfectors, steam cookers and laundry are all worked from electric heaters. Semi-permanent wards are equipped to accommodate an extra 150 patients.

At Kaduna the completion of the electric power scheme has greatly improved the facilities at the European and African hospitals. At Maiduguri the fine hospital built by the Native Administration has been completed by the opening of a sanitary block fitted with a high pressure steam disinfectors. The fine new modern hospital at Zaria was opened during the year, and the old hospital, which is some distance from the native town, was closed, except for out-patient dispensary treatment. A new hospital containing 28 beds was opened at Pankshin in the Plateau Province. This is a new medical station and forms a base for the dispensaries in the province.

NATIVE ADMINISTRATION DISPENSARY SYSTEM.

The system of scattered dispensaries, built and equipped by the Native Administrations came into use during the year. The previous year had been spent in training the attendants in the use of the standard equipment, and in building the dispensaries. Some of the Native Administrations which had been severely hit by the financial depression received assistance from a grant from the Colonial Development Fund for building dispensaries which they will continue to maintain.

The scheme generally is very popular with the chiefs and people and shows evidence of being of real value not only by providing simple medical and surgical treatment for a large population but even more by its educational value. The dispensaries will undoubtedly form centres of health propaganda and education and can gradually be expended into rural health centres, more particularly when the medical assistants who are now being trained in Nigeria become available for service at the dispensaries.

Altogether 61 dispensaries were opened during the year in the Northern Provinces (30 of which were previously in use but have been reconditioned and standardised) and 73 in the Southern Provinces.

The Assistant Director of Medical and Health Service, Northern Provinces, reports as follows on work done in Native Administration dispensaries in the Northern Provinces, Nigeria, in 1931:—

During the year 1931, 61 standard Native Administration dispensaries were opened in the Northern Provinces; 30 of these are previously established dispensaries which have been standardised, the other 31 are new.

2. They have been opened at varying dates throughout the year, some have been working nearly the whole year and a few only for one month. The average period per dispensary works out at about five months so that the figures given in Table II may be regarded as representing the work done in five months by 61 dispensaries. Table I gives a list of the dispensaries showing the dates of opening and by whom they are inspected.

3. 52,340 cases were treated at these dispensaries, the total attendances numbering 371,300. Table II shows the numbers of treated cases of each of the diseases which the attendants are supposed

to be able to recognise. The capabilities of the attendants vary greatly and, as many are almost illiterate, these figures cannot be regarded as entirely accurate, nevertheless they are approximately correct.

TABLE I.

Province.	Name of Dispensary.	Date of opening.	Inspecting Officer.
Adamawa (4) ...	Jalingo	15-8-31	M.O. or I.M.O., Yola.
	Numan	4-6-31	do.
	Shellem	20-6-31	do.
	Yola	1-1-31	do.
Bauchi (3) ...	Gombe	8-11-31	M.O., Bauchi.
	Misau	20-11-31	M.O., Azare.
	Toro	29-7-31	S.M.O., Jos.
Benue (6) ...	Abinsi	5-11-31	M.O., Makurdi.
	Igbor	20-8-31	do.
	Keffi	6-8-31	M.O., Lafia.
	Nasarawa	6-8-31	do.
	Oturkpo	12-10-31	M.O., Makurdi.
	Wukari	24-4-31	M.O., Ibi.
Bornu (4) ...	Biu	23-5-31	I.M.O., Bornu.
	Damatura	25-5-31	do.
	Dikwa	13-6-31	do.
	Potiskum	28-5-31	do.
Ilorin (6) ...	Ajassi	1-8-31	M.O., Ilorin.
	Ilorin	1-1-31	do.
	Kiama	1-5-31	do.
	Lafagi	1-5-31	do.
	Offa	1-4-31	do.
	Omu	1-8-31	do.
Kabba (5) ...	Idah	1-9-31	M.O., Ankpa.
	Kabba	8-6-31	M.O., Lokoja.
	Koton Karifi	10-10-31	do.
	Lokoja	30-6-31	do.
	Okene	27-6-31	do.
Kano (9) ...	Bichi	26-6-31	I.M.O., Kano.
	Dambarta	9-6-31	do.
	Daura	5-8-31	do.
	Dawki-ta-Yama	14-5-31	do.
	Gumel	11-9-31	do.
	Hadejia	5-7-31	do.
	Kazaure	3-8-31	do.
	Ringim	3-7-31	do.
	Wudil	16-5-31	do.
Niger (6) ...	Abuja	1-12-31	M.O., Minna.
	Katcha	7-11-31	M.O., Bida.
	Kontagora	29-9-31	M.O., Zuru.
	Kuta	23-11-31	M.O., Minna.
	Lemu	2-11-31	M.O., Bida.
	Zungeru	14-9-31	M.O., Minna.
Plateau (10) ...	Barakin Lahadi	24-6-31	I.M.O., Pankshin.
	Dengi	8-8-31	do.
	Gerkawa	24-10-31	do.
	Gindiri	14-9-31	do.
	Kwoi	15-8-31	M.O., Kafanchan.
	Makafa	24-6-31	M.O., Jos.
	Pankshin	1-1-31	I.M.O., Pankshin.
	Richa	10-11-31	do.
	Shendam	22-10-31	do.
	Wamba	26-8-31	M.O., Lafia.
Sokoto (8) ...	Argungu	1-7-31	I.M.O., Birnin Kebbi.
	Birnin Kebbi	1-7-31	do.
	Dabai	8-8-31	M.O., Zuru.
	Godabawa	16-11-31	I.M.O., Birnin Kebbi.
	Jega	31-7-31	do.
	Kaura-Namoda	9-7-31	M.O., Gusau.
	Tambawal	8-7-31	I.M.O., Birnin Kebbi.
	Yelwa	24-7-31	M.O., Zuru.

TABLE II.

<i>Disease.</i>						<i>Total.</i>
1.	Relapsing fever	...	...	...	...	23
2.	Malaria	...	...	...	...	1,861
3.	Smallpox	...	...	...	...	9
4.	Chickenpox	...	...	...	...	145
5.	Influenza	...	...	...	...	139
6.	Trypanosomiasis	...	...	...	...	96
7.	Cerebro-spinal meningitis	...	...	...	...	25
8.	Dysentery	...	...	...	...	576
9.	Leprosy	...	...	...	...	438
10.	Yaws	...	...	...	...	1,895
11.	Syphilis	...	...	...	...	3,069
12.	Conjunctivitis	...	...	...	...	984
13.	Other eye diseases	...	...	...	...	890
14.	Otitis media	...	...	...	...	352
15.	Other diseases of ear-wax, etc.	...	...	...	...	220
16.	Cough	...	...	...	...	2,563
17.	Pneumonia	...	...	...	...	246
18.	Tuberculosis of lung	...	...	...	...	124
19.	Diseases of teeth and gums	...	...	...	...	875
20.	Dyspepsia	...	...	...	...	1,522
21.	Diarrhœa (infants)	...	...	...	...	103
	Diarrhœa (adults)	...	...	...	...	416
22.	Constipation	...	...	...	...	5,539
23.	Hæmorrhoids	...	...	...	...	230
24.	Jaundice	...	...	...	...	202
25.	Dropsy, ascites	...	...	...	...	117
26.	Hernia, inguinal	...	...	...	...	173
	Hernia, umbilical	...	...	...	...	48
27.	Tænia	...	...	...	...	3,458
28.	Ascaris	...	...	...	...	702
29.	Guinea worm	...	...	...	...	782
30.	Arthritis	...	...	...	...	335
31.	Chronic rheumatism	...	...	...	...	3,094
32.	Gonorrhœa	...	...	...	...	1,570
33.	Orchitis and epididymitis	...	...	...	...	206
34.	Hydrocele	...	...	...	...	92
35.	Leucorrhœa	...	...	...	...	75
36.	Abortion	...	...	...	...	3
37.	Boil	...	...	...	...	1,090
38.	Abscess	...	...	...	...	1,295
39.	Ulcer	...	...	...	...	7,511
40.	Scabies—craw craw	...	...	...	...	1,376
41.	Other skin diseases	...	...	...	...	539
42.	Lymphadenitis	...	...	...	...	43
	Buboes	...	...	...	...	80
43.	Elephantiasis	...	...	...	...	37
44.	Chigoes	...	...	...	...	122
45.	Snake bite	...	...	...	...	37
46.	Scorpion sting	...	...	...	...	54
47.	Burns	...	...	...	...	322
48.	Wounds	...	...	...	...	3,551
49.	Fractures	...	...	...	...	41
50.	Tumours	...	...	...	...	165
51.	Paralysis	...	...	...	...	13
52.	Mania	...	...	...	...	10
53.	Poisoning, native medicine juju obsessions	...	...	...	...	14
54.	Fits, epilepsy	...	...	...	...	71
55.	Tetanus	...	...	...	...	5

TABLE II—continued.

<i>Disease.</i>						<i>Total.</i>
56.	Schistosomiasis	...	...	...	...	196
57.	Sore throat	...	...	...	...	166
58.	Ankylostomiasis	...	...	...	...	192
59.	Pleurodynia	...	...	...	...	129
60.	Lumbago	...	...	...	...	1,068
61.	Headache—cause unknown	...	...	...	...	953
62.	Debility	...	...	...	...	25
63.	Goitre	...	...	...	...	15
64.	Mumps	...	...	...	...	4
65.	Child welfare	...	...	...	...	7
66.	Mastitis	...	...	...	...	2
67.	Nephritis	...	...	...	...	2
68.	Whitlow	...	...	...	...	1
69.	Asthenia	...	...	...	...	8
Total						52,340

The Assistant Director of Medical and Health Service reports as follows upon the dispensaries in the Southern Provinces :—

There were 73 Native Administration dispensaries opened during the year at varying dates given on attached list.

The average working period for the dispensaries during the year is under six months and it was some time before the attendants kept proper records.

The total cases reported as treated is 82,761, total attendances 406,731, and the number of injections given was 4,701. The bulk of the injections given were bisoxyl, but most dispensaries also had a stock of neosalvarsan, which was soon exhausted.

The future success of the dispensaries depends on frequent inspections to keep the attendants alert and the dispensaries and equipment in good order. The success of the dispensaries in their initial year has been encouraging.

Province.	Name of Dispensary.				Date of Opening.	Inspecting Officer.
Abeokuta	Lafenwa	...	...	...	11-5-31	I.M.O. Abeokuta.
	Imala	...	...	...	15-5-31	do.
	Otta	...	...	...	23-5-31	do.
	Owode	...	...	...	25-5-31	do.
	Ilaro	...	...	...	12-6-31	do.
	Ado	...	...	...	18-7-31	do.
	Meko	...	...	...	28-8-31	do.
	Aiyetoro	...	...	...	28-8-31	do.
Benin	Ogwashi-Uku	...	...	...	9-6-31	M.O. Agbor.
	Onicha Olona	...	...	...	13-6-31	do.
	Uburukwu	...	...	...	14-6-31	do.
	Ekiadolor	...	...	...	8-7-31	M.O. Benin.
	Ekanwan	...	...	...	10-7-31	do.
	Ogbiade	...	...	...	16-7-31	I.M.O. Benin.
	Ehor	...	...	...	28-7-31	do.
	Ugo	...	...	...	20-8-31	do.
	Auchi	...	...	...	23-8-31	do.
	Ewohimi	...	...	...	25-8-31	do.
	Igwabazua	...	...	...	30-8-31	do.
	Irrua	...	...	...	12-9-31	do.
	Sabongida	...	...	...	14-9-31	do.
	Ibillo	...	...	...	1-10-31	do.

Province.	Name of Dispensary.	Date of Opening.	Inspecting Officer.
Calabar	Uyo	8-9-31	M.O. Ikot-Ekpene.
	Afaha	20-11-31	do.
	Ntawdina	20-11-31	do.
Cameroons	Tiko	15-9-31	M.O. Victoria.
	Nyassoso	1-10-31	M.O. Kumba.
Ijebu Ode	Idowa	12-5-31	M.O. Ijebu Ode.
	Ife	6-6-31	do.
	Owu	8-6-31	do.
	Iwopin	8-6-31	do.
	Shagamu	1-7-31	do.
	Ode Remo... ..	1-7-31	do.
	Ijebu Igbo... ..	2-7-31	do.
Ogoja	Ediba	6-7-31	M.O. Abakaliki.
	Ezzah	21-10-31	M.O. Ogoja.
	Ekwo	21-10-31	do.
	Aboabam	18-12-31	do.
Ondo	Egosi	24-5-31	M.O. Akure.
	Ijero	26-5-31	do.
	Owo	1-6-31	I.M.O. Benin City.
	Ondo	6-6-31	do.
	Ifon	10-6-31	do.
	Okitipupa	4-8-31	M.O. Akure.
Onitsha	Eke	17-8-31	M.O. Enugu.
	Obolo	17-8-31	M. O. Onitsha.
	Awgu	8-7-31	do.
	Aguleri	19-10-31	do.
	Isuofia	22-10-31	do.
	Newi	29-10-31	do.
Owerri	Ahoada	10-8-31	M.O. Umuahia.
	Bende	4-9-31	do.
	Obokia	16-9-31	do.
	Brass	15-9-31	do.
	Owerrinta	10-10-31	M.O. Aba.
	Oguta	26-12-31	M.O. Owerri.
Oyo	Iseyin	8-5-31	Reconditioned.
	Shaki	8-5-31	do.
	Okeho	8-5-31	do.
	Gbongan	18-5-31	I.M.O. Oyo.
	Ikire	18-5-31	do.
	Ede	18-5-31	do.
	Ikirun	18-5-31	do.
	Fiditi	4-6-31	do.
	Igbajo	12-6-31	do.
	Ife	25-6-31	do.
	Ilesha	15-6-31	do.
	Ipetu-Imodu	12-6-31	do.
	Illa	10-9-31	do.
	Warigi	7-8-31	M.O. Sapele.
Warri	Ukpe-Sobo	7-8-31	do.
	Okpara	7-8-31	do.
	Abbi	7-8-31	do.

	<i>Disease.</i>	<i>Total.</i>
1.	Relapsing fever	159
2.	Malaria	7,260
3.	Smallpox	83
4.	Chickenpox	65
5.	Influenza	176
6.	Trypanosomiasis	37
7.	Cerebro-spinal meningitis	33
8.	Dysentery	553
9.	Leprosy	230
10.	Syphilis	954
11.	Yaws	4,605
12.	Conjunctivitis	1,628
13.	Other eye diseases	247
14.	Otitis media	2,202

<i>Disease.</i>							<i>Total.</i>
15.	Other diseases of ear-wax, etc.	...	...	...	...	...	499
16.	Cough	...	...	...	...	...	4,665
17.	Pneumonia	...	...	...	...	...	183
18.	Tuberculosis of lungs	...	...	...	...	...	55
19.	Diseases of teeth and gums	...	...	...	...	...	1,849
20.	Dyspepsia	...	...	...	...	...	2,052
21.	Diarrhoea, infants	...	...	...	...	...	363
22.	Diarrhoea, adults	...	...	...	...	...	1,027
23.	Constipation	...	...	...	...	...	7,155
24.	Hæmorrhoids	...	...	...	...	...	386
25.	Jaundice	...	...	...	...	...	246
26.	Dropsy, ascites	...	...	...	...	...	57
27.	Hernia, inguinal	...	...	...	...	...	124
28.	Hernia, umbilical	...	...	...	...	...	6
29.	Tænia, tape worm	...	...	...	...	...	999
30.	Ascaris	...	...	...	...	...	9,456
31.	Dracunculus, guinea worm	...	...	...	...	...	897
32.	Arthritis	...	...	...	...	...	1,287
33.	Chronic rheumatism	...	...	...	...	...	6,952
34.	Gonorrhœa	...	...	...	...	...	2,128
35.	Orchitis and epididymitis	...	...	...	...	...	50
36.	Hydrocele	...	...	...	...	...	18
37.	Vaginal discharge, leucorrhœa	...	...	...	...	...	116
38.	Abortion	...	...	...	...	...	16
39.	Boil	...	...	...	...	...	301
40.	Abscess	...	...	...	...	...	576
41.	Ulcer	...	...	...	...	...	13,126
42.	Scabies—craw craw	...	...	...	...	...	3,261
43.	Other skin diseases, tinea	...	...	...	...	...	1,124
44.	Lymphadenitis, buboes	...	...	...	...	...	173
45.	Elephantiasis	...	...	...	...	...	21
46.	Chigoes	...	...	...	...	...	36
47.	Snake bite	...	...	...	...	...	36
48.	Scorpion sting	...	...	...	...	...	22
49.	Burns	...	...	...	...	...	274
50.	Wounds	...	...	...	...	...	3,334
51.	Fractures	...	...	...	...	...	175
52.	Tumours	...	...	...	...	...	249
53.	Paralysis	...	...	...	...	...	43
54.	Mania	...	...	...	...	...	14
55.	Poisoning—native medicines	...	...	...	...	...	9
56.	Poisoning—juju obsessions	...	...	...	...	...	4
57.	Fits—epilepsy	...	...	...	...	...	62
58.	Tetanus	...	...	...	...	...	3
59.	Total Attendances during month	...	...	...	...	...	40,673
60.	Total No. of Injection N.A.B. or Leprosy	...	...	...	...	...	4,701

MEDICAL WORK OF RELIGIOUS MISSIONS.

The work of mission doctors and of missionaries who hold dispensers licences is shown in the table given below which has been compiled from information kindly supplied by the directors of the missions. The medical mission field suffered a serious loss in the death from yellow fever of Dr. Russell Robertson, of the Church of the Brethren Mission at Garkida in Adamawa Province, to whose energy and skill the large hospital and leper settlement at Garkida are due. Mention has already been made of the new maternity ward—the Mary Elmes Memorial Hospital—opened by the C.M.S. at Iyi Enu. The hospital of the Dutch Reformed Church Mission at Mkar in the Benue Province carried out most useful work amongst the Munshi tribes in that district.

MEDICAL WORK OF MISSIONS.

Mission.	No. of Stations.		Doctors.	Holders of Missionary Permits.	NATURE OF WORK.				Cases treated.	Total attendance.	Remarks.
	Total.	Where Medical work done.			Hospitals.	Dispensaries.	Leprosy.	Infant Welfare and Maternity.			
A. NORTHERN PROVINCES.											
Church Missionary Society	7	1	2	2	1	1	1	...	449	10,976	Hospital at Zaria.
Sudan Interior Mission	28	16	1	33	...	16	3	...	19,058	100,351	
Sudan United Mission	27	20	3	36	1	20	4	2	25,953	160,859	Hospital at Vom.
United Missionary Society	7	3	...	4	...	3	...	...	...	31,900	
Dutch Reformed Church Mission	5	4	1	...	1	4	2	1	6,335	157,700	Hospital at Mkar.
Christian Mission in many lands	3	2	...	2	...	2	2	...	19,500	...	
Church of the Brethren Mission	4	4	2	1	2	4	2	2	2,741	58,612	Hospital and Leper Colony at Garkida.
Primitive Methodist Church	1	1	...	...	...	1	...	...	...	...
B. SOUTHERN PROVINCES.											
Catholic Sacred Heart Hospital, Abeokuta	1	...	...	...	1	...	...	1	1,812	10,884	
Baptist Mission, Ogbomosho	1	...	3	...	1	3	Some	1	...	...
Wesleyan Mission	1	...	1	...	1	...	...	1	4,076	31,333	
United Free Church of Scotland Mission	1	...	1	...	1	...	...	...	1,012	...	
Primitive Methodist Mission	...	...	1	...	3	13	3	...	13,767	34,723	
Qua Iboe Mission	...	...	1	...	1	10	Some	...	16,260	...	In-patients, 250. Out-patients, 16,000. Operations, 200.
Amachara Medical Mission	...	...	...	2	...	1	...	1	5,430	15,444	Under Doctor P.M. Mission at Ikot-Ekpene.
Iyi-Enu Medical Mission	1	...	2	4	1	...	...	1	34,835	...	In-patients, 1,677. Maternity, 256. Major Operations, 117. Minor Operations, 727.

DENTAL REPORT.

The Government dentist, Mr. Cunningham, reports as follows upon his work in Northern Provinces :—

From 1st January, 1931 to 12th December, 1931.

1. The above period of 346 days was divided amongst the various stations as follows :—

Kaduna 189 days, Kano 41 days, Makurdi 48 days, Zaria 24 days, Ilorin 18 days and Jos 26 days.

2. Details of the work done for Government officials are shown below :—

	European Officials.	African Officials and Wives.	Grand Total.
Fillings	481	18	499
Temp. fillings and dressings ...	160	18	178
Extractions	81	184	265
Scalings	169	9	178
Root treatments	37	—	37
Crowns	5	—	5
Denture repairs	20	12	32
Partial dentures	2	41	43
Full dentures	6	15	21
Attendances for treatment ...	742	322	1,064

The Government dentist, Mr. Pearson, reports upon his work in the Southern Provinces :—

From 1st January, 1931 to 31st December, 1931.

It is gratifying to place on record an increase in the number of Government officials presenting themselves for dental treatment during the year 1931.

The following towns were visited as centres in order to facilitate the treatment of officials in the Provinces :—

Ibadan, Benin City, Enugu and Port Harcourt.

Figures of Work done.

European officials	692
African ,,	276
Wives and children	100

Figures of the Work.

Synthetic fillings	185
Amalgams	400
Copper amalgams	51
Gutta percha (temporary fillings)	200
Gutta percha (permanent fillings)	23
Scalings	605
Extractions	450
General suppurative cervical periodontitis	64
Stomatitis	76
Stomatitis ulcerative	3

SURGICAL OPERATIONS, 1931.

Nature of Operation.	Total.	Cured.	Relieved.	Unrelieved.	Died.
A. GENERAL.					
Amputations	168	136	24	...	8
Appendectomy	57	54	1	...	2
Bubonocele R. cure ...	83	83	...	...	...
Fractures plates, etc. ...	41	32	5	2	2
Herniotomy	1,573	1,484	34	8	47
Hepatic abscess (drainage, etc.)	47	47	...	...	...
Laparotomy	55	30	7	...	18
Perforated gastric ulcer (suture)	...	...	...	...	...
Perforated duodenal ulcer (suture)	...	...	...	...	...
Hæmorrhoids (radical cure) ...	70	67	2	...	1
Colotomy	5	2	3	...	...
Excision, benign tumours and cysts	974	928	28	9	9
Excision (malignant tumours)	76	64	9	1	2
Excision glands	20	18	2	...	...
Excision breast	3	3	...	...	...
Enterectomy	71	58	10	1	2
Sequestrotomy	121	108	9	4	...
Osteotomy	42	38	1	...	3
Trephining	1	1	...	...	...
Splenectomy	3	1	1	...	1
Cholecystomy ... ..	...	...	...	...	...
Curettage general	487	470	10	5	2
Skin Grafting	282	269	12	1	...
Thoractomy ... ..	...	...	...	...	...
Tonsillectomy	9	8	1	...	...
Thyroidectomy	11	10	...	...	1
Omentopexy	3	1	1	...	1
Ischio rectal abscess ...	12	10	1	1	...
Other operations	373	298	60	3	12
B. EYES.					
Cataract	25	20	5	...	...
Enucleation	13	12	1	...	...
Iridectomy	2	2	...	...	...
Other operations	76	74	2	...	...
C. EAR.					
Mastoid schwartze operation	9	9	...	...	...
Other operations	5	5	...	...	...
D. GENITO URINARY, MALE.					
External urethrotomy ...	107	77	29	...	1
Internal urethrotomy ...	9	6	3	...	...
Dilation of stricture ...	407	206	195	2	4
Elephantiasis of scrotum ...	129	117	8	...	4
Hydrocele (radical cure) ...	575	510	60	...	5
Varicocele	2	2	...	...	...
Circumcision	1,244	1,241	3	...	...
Cystotomy	26	12	12	1	1
Orchidectomy	24	21	3	...	...
Tumour of bladder ... ..	...	...	...	...	...
Other operations	46	44	2	...	...
E. GENITO URINARY, FEMALE.					
Abdominal hysterectomy ...	15	12	2	...	1
Elephantiasis	5	3	...	...	2
Ovariectomy	22	18	...	2	2
Salpingectomy	9	8	1	...	...
Hysteropexy	6	5	...	...	1
Perineorrhaphy	13	12	1	...	...
Endometritis (curettage) ...	54	44	7	...	3
Colporrhaphy	3	2	...	...	1
Other operations	71	62	4	...	5
Carried forward ...	7,484	6,744	559	40	141

SURGICAL OPERATIONS, 1930—*continued.*

Nature of Operation.	Total.	Cured.	Relieved.	Unrelieved.	Died.
Brought forward ...	7,484	6,744	559	40	141
F. OBSTETRICAL.					
Abortion—curettage ..	71	62	4	...	5
Forceps extraction ...	46	42	1	...	3
Podalic version	17	13	...	...	4
Craniotomy	1	1	...	...	...
Ectopic gestation ...	...	...	...	...	...
Cæsarian section	8	3	1	...	4
Retained placenta (curettage)	45	42	...	...	3
Other operations ... ..	...	...	...	...	...
G. MINOR SURGICAL OPERATIONS.					
Abscesses, general Injuries, etc.	10,367	9,100	1,144	22	101
Totals	18,039	16,007	1,709	62	261

VII.—PRISONS AND ASYLUMS.

The following figures give a general idea of the health of prisoners in Government prisons during the year 1931 :—

		Northern Provinces.		Southern Provinces.	
		1930.	1931.	1930.	1931.
Average daily number in Prison	...	563	481	7,173	6,979
Total number on sick list	...	425	377	22,479	27,541
Total number of days on sick list	...	3,551	3,252	68,930	77,007
Average daily sick	...	1·1	1·03	61·5	59·17
Total number of deaths	...	10	6	153	119
Death rate per thousand	...	17·7	12·4	21·3	17·5

The following table shows the causes of deaths among prisoners :—

<i>Northern Provinces.</i>				<i>Brought forward</i>	...	34
Diarrhoea	...	...	1	Fit following epilepsy	...	1
Heart Failure	...	...	1	Gangrene of the bowels	...	1
Natural causes	...	...	3	Gangrene of the leg	...	1
Stomatitis	...	...	1	Gastritis acute	...	2
			—	Heart failure	...	2
Total	...	...	6	Heat stroke	...	1
				Hernia inguinal and strangulated		3
<i>Southern Provinces.</i>				Hydrocele	...	1
Accident	...	...	1	Influenza and complications	...	1
Acute dilatation of stomach	...	...	1	Intestinal obstruction	...	1
Acute Inflammation of intestines	...	...	1	Kidney disease	...	1
Aneurism of the aorta	...	...	1	Leprosy acute	...	1
Ankylostomiasis	...	...	1	Mania and exhaustion	...	2
Atrophic cirrheses of liver with	...	...	1	Myocarditis	...	1
ascitis	...	...		Natural causes	...	2
Bronchitis	...	...	7	Nephritis chronic	...	3
Cancer	...	...	1	Peritonitis	...	5
Cardio-renal diseases	...	...	1	Pleurisy	...	1
Cerebral hæmorrhage	...	...	1	Pneumonia and broncho pneum.		30
Chronic gonorrhœa with extra-	...	...		Pneumonia lobar	...	9
vasation of urine	...	...	1	Septicæmia	...	3
Colitis ulcerated	...	...	1	Small-pox	...	1
Coryza	...	...	1	Syncope	...	1
Debility and wounding	...	...	1	Syphilitic aortitis	...	1
Diarrhoea	...	...	1	Toxæmia	...	1
Dropsy	...	...	1	Trypanosomiasis	...	1
Dysentery	...	...	11	Tuberculosis	...	3
Enteritis	...	...	1	Tumour of spleen	...	1
			—	Unknown	...	2
				Valvular disease of the heart		2
						—
Carried forward	...	...	34	Total	...	119

An investigation was carried out by the political officers and medical staff into the health conditions in Native Administration prisons in the Northern Provinces. There is some evidence that a lowered resistance to infection occurs in prisoners in these gaols which may be due to an unbalanced diet, and the Dietetic Pathologist has drawn up a dietary which can be varied according to articles of food which can be obtained locally while still maintaining a balanced total and a vitamin sufficiency.

VIII.—METEOROLOGY.

Tables showing comparative monthly rainfall for Lagos and meteorological returns of various stations for 1931 are appended.

COMPARATIVE MONTHLY RAINFALL--LAGOS, 1921-1931.

Month.	YEAR.										
	1921.	1922.	1923.	1924.	1925.	1926.	1927.	1928.	1929.	1930.	1931.
January	0.31	0.59	0.89	1.94	1.50	...	2.49	1.77	.02	1.38	0.94
February	0.02	0.81	1.22	1.12	0.40	3.01	2.35	2.22	1.46	2.21	1.47
March	3.42	1.50	2.60	5.28	6.61	2.74	2.78	8.20	1.73	3.27	5.89
April	4.81	7.42	6.43	7.55	7.00	12.76	3.37	6.96	7.04	5.01	7.16
May... ..	21.55	8.13	13.55	3.45	12.16	13.69	8.19	15.33	11.34	8.61	8.87
June... ..	15.34	26.36	25.08	5.53	20.40	13.06	7.08	21.05	24.79	13.28	17.73
July	16.86	2.75	10.44	2.48	15.22	10.07	8.57	2.53	19.93	18.40	17.81
August	3.53	5.73	0.12	0.10	1.28	0.26	0.25	2.05	.81	.66	2.10
September	7.94	11.32	3.15	4.10	5.98	11.05	3.04	5.60	3.11	2.67	12.54
October	3.74	15.40	5.36	15.62	2.98	3.79	13.33	12.67	6.03	12.46	5.87
November	3.35	3.51	2.72	0.83	2.87	5.47	2.38	.54	4.10	1.88	2.24
December	2.35	0.85	...	1.92	...	0.07	1.17	.13	6.02	1.69	0.93
Total	83.22	84.37	71.56	49.92	76.40	75.97	55.00	79.05	86.38	71.52	83.55

TABLE III.
METEOROLOGICAL RETURNS FOR 1931.

STATION.	Absolute Shade Max.	Absolute Shade Min.	Average Max.	Average Min.	Relative Humidity.	Rainfall inches.
	F %	F %	F %	F %		
Ilorin	107	60	96·9	59·7	84	47·78
Kaduna	102	52	87·1	55·4	73·2	46·85
Maiduguri	112	50	104·9	59·1	59·6	31·99
Kano	110	54	101·8	62·8	49·9	46·53
Lokoja	103	62	96·3	69·2	61·2	28·06
Yola	109	60	99·4	67·5	76·1	32·64
Lagos	96	70	90·3	72	83·8	83·55
Ibadan	99	68	91·8	69·8	83	49·83
Calabar	90	68	84·7	70·1	89·1	132·79
Enugu	98	60	93	68·4	79·6	81·77

IX.—SCIENTIFIC.

The annual reports of the laboratory service and of the tsetse investigation appear as appendices A and B. Appendix C contains the work of the X-ray department of the African Hospital, Lagos. Appendix D is a report upon the incidence of yaws and syphilis at Calabar.

W. B. JOHNSON,
*Director of Medical and Sanitary
Service.*

RETURNS.

TABLE I.

FINANCIAL.

I.—Expenditure.

(a).—PERSONAL EMOLUMENTS.

(1) MEDICAL.

	£	s.	d.
Administrative officers	217,610	7	5
Specialists			
Senior medical officers			
Medical officers (European and African) ...			
Dental surgeons			
European nursing staff			
Clerical staff			
Dispensers and African nursing staff ...			
Other items under Personal Emoluments ...			

(2) HEALTH

Administrative officers	52,717	7	10
Health officers			
European sanitary inspectors			
African sanitary inspectors			
Other items under Personal Emoluments ...			

(3) LABORATORY.

European staff	14,830	15	2
African staff			

(b)—OTHER CHARGES.

(1) MEDICAL.

Railway transport	7,273	14	0
Medical, surgical, dental and X-ray equipment and supplies	23,350	10	9
Diets, provisions and necessaries	15,075	4	3
Other items under Other Charges	49,435	8	2
	<u>£95,124</u>	<u>17</u>	<u>2</u>

SPECIAL EXPENDITURE.

Tsetse fly investigation	18,037	5	5
Hospital equipment	746	9	11
Other items under Special Expenditure ...	36	2	3
	<u>£18,819</u>	<u>17</u>	<u>7</u>

(2) HEALTH.

	£	s.	d.
Railway transport	1,436	11	7
General sanitary	30,710	12	2
Other items under Other Charges	18,417	7	7
	<u>£50,564</u>	<u>11</u>	<u>4</u>

Special Expenditure:—

Plague expenses	6,417	10	3
Other items under Special Expenditure	350	17	6
	<u>£6,768</u>	<u>7</u>	<u>9</u>

(3) LABORATORY.

Railway transport	335	3	2
Other items under Other Charges	4,472	6	5
	<u>£4,807</u>	<u>9</u>	<u>7</u>

TOTAL, MEDICAL AND SANITARY EXPENDITURE	441,615	9	1
TOTAL LABORATORY EXPENDITURE	19,638	4	9
	<u>£461,253</u>	<u>13</u>	<u>10</u>

II.—Receipts.

Hospital and medical receipts	8,804	11	11
Births and deaths	11	18	0
	<u>£8,816</u>	<u>9</u>	<u>11</u>

TABLE II.

INTER DEPARTMENTAL SERVICES.

RECEIPTS AND EXPENDITURE, MEDICAL DEPARTMENT, FOR THE YEAR 1931.

RECEIPTS.				EXPENDITURE.			
	£	s.	d.		£	s.	d.
Hospitals and medical receipts for the year 1931	8,816	9	11	Marine services to Medical and Sanitary Department	1,606	1	8
Grant from the Medical Research Council	375	0	0	Electric light	3,446	10	1
Medical charges against the Nigerian Railway	20,210	19	0	Water	1,616	7	0
Sanitary charges against the Nigerian Railway				Railway services	9,753	12	1
Excess of expenditure over Receipts	448,273	15	9	Total Personal Emoluments, Medical, Sanitary and Research	285,158	10	5
	<u>£477,676</u>	<u>4</u>	<u>8</u>	Total other Charges, Medical, Sanitary and Research	176,095	3	5
					<u>£477,676</u>	<u>4</u>	<u>8</u>

TABLE IV.
RETURN OF DISEASES AND DEATHS (EUROPEAN)
FOR THE YEAR 1931.

Diseases.		IN-PATIENTS.						OUT-PATIENTS.			
		Remaining in Hospital at end of 1930.	TOTAL.			Total cases treated.	Remaining in Hospital at end of 1931.	Male.	Female.	Deaths.	
			Admissions.		Deaths.						
			Male.	Female.							
I.—Epidemic, Endemic, and Infectious Diseases.											
1. Enteric Group--											
	(a) Typhoid Fever ...	...	2	...	1	2	...	...	...	...	...
	(b) Paratyphoid A. ...	...	2	...	...	2	...	...	1	...	...
	(c) Paratyphoid B. ...	...	...	...	...	...	...	...	...	...	...
	(d) Type not defined ...	...	...	...	...	...	...	...	...	...	...
2. Typhus ...		...	...	...	...	...	...	...	...	...	...
3. Relapsing Fever ...		...	...	...	...	...	...	...	...	...	...
4. Undulant Fever ...		...	...	...	...	...	...	...	...	...	...
5. Malaria—											
	(a) Tertian ...	1	12	...	...	13	1	54	10	...	...
	(b) Quartan ...	...	...	...	...	...	...	5	2	...	...
	(c) Aestivo-autumnal ...	12	265	8	...	285	4	573	74	...	...
	(d) Cachexia ...	...	2	...	...	2	1	138	14	...	...
	(e) Blackwater ...	...	7	...	4	7	...	11	...	...	...
6. Smallpox ...		...	...	...	...	...	...	1	...	...	...
Alastrim ...		...	...	...	...	...	...	1	...	...	...
7. Measles ...		...	...	...	...	...	...	2	...	...	...
8. Scarlet Fever ...		...	...	...	...	...	...	1	...	...	...
9. Whooping Cough ...		...	...	...	...	...	...	...	...	...	...
10. Diphtheria ...		...	...	...	...	...	...	7	...	...	...
11. Influenza ...		...	51	...	...	51	...	183	23	...	...
12. Miliary Fever ...		...	...	...	...	...	...	1	...	...	...
13. Mumps ...		...	...	...	...	...	...	1	...	...	...
14. Cholera ...		...	...	...	...	...	...	...	...	...	...
15. Epidemic diarrhoea ...		...	...	...	...	...	...	...	...	...	...
16. Dysentery—											
	(a) Amœbic ...	...	38	3	...	41	1	57	4	1	...
	(b) Bacillary ...	1	11	...	...	12	1	11	4	...	...
	(c) Undefined or due to other causes ...	...	5	...	...	5	...	4	1	...	...
17. Plague—											
	(a) Bubonic ...	...	...	...	...	...	...	...	...	...	...
	(b) Pneumonic ...	...	...	...	...	...	...	...	...	...	...
	(c) Septicaemic ...	...	...	...	...	...	...	...	...	...	...
	(d) Undefined ...	...	...	...	...	...	...	...	...	...	...
18. Yellow Fever ...		...	4	...	2	4	...	3	...	2	...
19. Spirochætosis ictero-hæmorrhagica ...		...	...	...	...	...	...	...	...	...	...
20. Leprosy ...		...	...	...	...	...	...	...	...	...	...
21. Erysipelas ...		...	...	...	...	...	...	...	...	...	...
22. Acute Poliomyelitis ...		...	...	...	...	...	...	...	...	...	...
23. Encephalitis Lethargica ...		...	...	...	...	...	...	...	...	...	...
24. Epidemic Cerebro-spinal Fever ...		...	...	...	...	...	...	...	...	...	...
25. Other Epidemic Diseases—											
	(a) Rubeola (German Measles) ...	...	4	...	...	4	...	16	2	...	...
	(b) Varicella (Chicken-pox) ...	...	...	...	...	...	...	2	...	...	...
	(c) Kala-azar ...	...	...	...	...	...	...	...	...	...	...
	(d) Phlebotomus Fever ...	...	...	...	...	...	...	1	...	...	...
	(e) Dengue ...	...	2	...	...	2	...	11	1	...	...
Carried forward ...		14	405	11	7	430	8	1,083	136	3	...

TABLE IV.—RETURN OF DISEASES AND DEATHS (EUROPEAN)
FOR THE YEAR 1931—*continued*.

Diseases.	IN-PATIENTS.					Remaining in Hospital at end of 1931.	OUT-PATIENTS.		
	Remaining in Hospital at end of 1930.	TOTAL.			Total cases treated.		Male.	Female.	Deaths
		Admissions.		Deaths.					
		Male.	Female.						
Brought forward ...	14	405	11	7	430	8	1,083	136	3
I.— <i>Epidemic, Endemic, and Infectious Diseases</i> —contd.									
Other Epidemic Diseases—									
(f) Epidemic Dropsy
(g) Yaws
(h) Trypanosomiasis	2	...	...	2	...	1	...	...
26. Glanders
27. Anthrax	1	...	...	1	...	...	...	...
28. Rabies
29. Tetanus
30. Mycosis	1	...	...
31. Tuberculosis, Pulmonary and Laryngeal	4	...	1	4	...	4	1	1
32. Tuberculosis of the Meninges or Central Nervous System
33. Tuberculosis of the Intestines or Peritoneum
34. Tuberculosis of the Vertebral Column
35. Tuberculosis of Bones and Joints
36. Tuberculosis of other organs—									
(a) Skin or Subcutaneous Tissue (Lupus)
(b) Bones
(c) Lymphatic System	1	...	...	1	...	...	...	...
(d) Genito-urinary
(e) Other Organs
37. Tuberculosis disseminated—									
(a) Acute	3	...	...
(b) Chronic
38. Syphilis—									
(a) Primary	2	...	...	2	...	36	...	...
(b) Secondary	2	...	...	2	...	11	...	...
(c) Tertiary	2	...	...
(d) Hereditary...	1	...	...
(e) Period not indicated	29	...	...
39. Soft Chancre	5	...	...	5	...	22	...	...
40. A.—Gonorrhœa and its complications	4	...	...	4	1	127	3	...
B.—Gonorrhœal Ophthalmia	1	...	...
C.—Gonorrhœal Arthritis
D.—Granuloma Venereum
41. Septicaemia
42. Other Infectious Diseases
II.— <i>General Diseases not mentioned above.</i>									
43. Cancer or other malignant Tumours of the Buccal Cavity
Carried forward ...	14	426	11	8	451	9	1,321	140	4

TABLE IV.—RETURN OF DISEASES AND DEATHS (EUROPEAN)
FOR THE YEAR 1931—*continued*.

Diseases.	IN-PATIENTS.						OUT-PATIENTS.		
	Remaining in Hospital at end of 1930.	TOTAL.			Total cases treated.	Remaining in Hospital at end of 1931.	Male.	Female.	Deaths.
		Admissions.		Deaths.					
		Male.	Female.						
Brought forward	14	426	11	8	451	9	1,321	140	4
II.—General Diseases not men- tioned above—contd.									
44. Cancer or other malignant Tumours of the Stomach or Liver
45. Cancer or other malignant Tumours of the Peritoneum intestines, Rectum
46. Cancer or other malignant Tumours of the Female Geni- tal Organs
47. Cancer or other malignant Tumours of the Breast	1	...	...	1	...	...	...	...
48. Cancer or other malignant Tumours of the Skin	1	...	...	1	...	1	...	...
49. Cancer or other malignant Tumours of Organs not specified	2	...	...
50. Tumours non-Malignant	1	...	...	1	...	34	3	...
51. Acute Rheumatism	2	...	...	2	...	50	5	...
52. Chronic Rheumatism	4	...	...	4	...	94	12	...
53. Scurvy (including Barlow's Disease)	17	...	...
54. Pellagra
55. Beri-Beri
56. Rickets
57. Diabetes (not including Insi- pidus)	3	...	1	3	...	1	...	...
58. Anæmia--									
(a) Pernicious	5	...	...	5	...	32	16	...
(b) Other Anæmias and Chlo- rosis	6	...	...	6	...	44	12	...
59. Diseases of the Pituitary Body
60. Diseases of the Thyroid Gland—									
(a) Exophthalmic Goitre
(b) Other diseases of the Thyroid Gland, Myxœ- dema
61. Diseases of the Para-Thyroid Glands...
62. Diseases of the Thymus
63. Diseases of the Supra-Renal Glands
64. Diseases of the Spleen	4	...	...
65. Leukæmia—									
(a) Leukæmia
(b) Hodgkin's Disease
66. Alcoholism	6	...	...	6	...	1	...	...
67. Chronic poisoning by mineral substances (lead, mercury, &c.)
68. Chronic poisoning by organic substances (Morphia, Cocaine, &c.)	1	...	...
Carried forward	14	455	11	9	480	9	1,652	188	4

TABLE IV.—RETURN OF DISEASES AND DEATHS (EUROPEAN)
FOR THE YEAR 1931—*continued*.

Diseases.	IN-PATIENTS.						OUT-PATIENTS.		
	Remaining in Hospital at end of 1930.	TOTAL.			Total cases treated.	Remaining in Hospital at end of 1931.	Male.	Female.	Deaths.
		Admissions.		Deaths.					
		Male.	Female.						
Brought forward	14	455	11	9	480	9	1,652	188	4
II.—General Diseases not men- tioned above—contd.									
69. Other General Diseases—									
Auto-intoxication ... ..	...	4	...	...	4	...	3	...	...
Purpura Hæmorrhagica ... ..	...	...	...	...	...	...	...	...	...
Hæmophilia ... ..	...	...	...	...	...	...	...	...	...
Diabetes Insipidus ... ..	...	...	...	...	...	...	...	...	...
III.—Affections of the Nervous System and Organs of the Senses.									
70. Encephalitis (not including Encephalitis Lethargica) ... ..	...	...	...	...	...	...	...	...	...
71. Meningitis (not including Tuberculous Meningitis or Cerebro-spinal Meningitis) ... ..	...	...	...	...	...	...	...	...	...
72. Locomotor Ataxia ... ..	...	...	...	...	...	...	1	...	...
73. Other affections of the Spinal Cord ... ..	...	...	...	...	...	...	...	...	...
74. Apoplexy—									
(a) Hæmorrhage ... ..	...	...	...	...	...	...	1	...	1
(b) Embolism ... ..	...	...	...	...	...	...	...	...	...
(c) Thrombosis ... ..	...	...	...	...	...	...	...	...	...
75. Paralysis—									
(a) Hemiplegia ... ..	...	1	...	...	1	...	1	...	...
(b) Other Paralysis ... ..	...	...	...	...	...	...	1	...	...
76. General Paralysis of the Insane ... ..	...	1	...	...	1	...	...	...	...
77. Other forms of mental Alienation ... ..	...	4	...	...	4	...	...	1	...
78. Epilepsy ... ..	...	2	...	...	2	...	2	...	...
79. Eclampsia, Convulsions (non- puerperal) 5 years or over ... ..	...	...	...	...	...	...	...	...	...
80. Infantile Convulsions ... ..	...	...	...	...	...	...	...	...	...
81. Chorea ... ..	...	1	...	...	1	...	3	...	...
82. A.—Hysteria ... ..	...	3	...	...	3	...	4	4	...
B.—Neuritis ... ..	...	6	...	...	6	...	62	10	...
C.—Neurasthenia ... ..	...	27	...	...	27	...	73	14	...
83. Cerebral Softening ... ..	...	...	...	...	...	...	...	...	...
84. Other affections of the Ner- vous System, such as Paralysis Agitans ... ..	...	2	...	...	2	...	8	1	...
85. Affections of the Organs of Vision—									
(a) Diseases of the eye ... ..	...	...	...	...	...	...	14	...	...
(b) Conjunctivitis ... ..	...	3	...	...	3	...	74	5	...
(c) Trachoma ... ..	...	...	...	...	...	...	9	1	...
(d) Tumours of the Eye ... ..	...	...	...	...	...	...	6	2	...
(e) Other affections of the Eye	1	5	...	...	6	...	68	10	...
86. Affections of the Ear or Mastoid Sinus	1	12	2	...	15	...	407	177	...
Carried forward	16	526	13	9	555	9	2,389	413	5

TABLE IV.—RETURN OF DISEASES AND DEATHS (EUROPEAN)

FOR THE YEAR 1931—continued.

Diseases.	IN-PATIENTS.						OUT-PATIENTS.		
	Remaining in Hospital at end of 1930.	TOTAL.			Total cases treated.	Remaining in Hospital at end of 1931.	Male.	Female.	Deaths.
		Admissions.		Deaths.					
		Male.	Female.						
Brought forward ...	16	526	13	9	555	9	2,389	413	5
IV.—Affections of the Circulatory System									
87. Pericarditis ...	...	...	...	...	..	...	1	...	...
88. Acute Endocarditis or Myocarditis ...	...	5	...	3	5	...	...	1	1
89. Angina Pectoris ...	...	...	...	...	...	...	2	...	...
90. Other Diseases of the Heart—									
(a) Valvular ...	...	...	...	...	...	...	2	...	...
Mitral ...	...	3	...	...	3	...	...	...	...
Aortic ...	...	...	...	...	...	...	1	...	...
Tricuspid ...	...	...	...	...	...	...	...	...	...
Pulmonary ...	...	...	...	...	...	...	...	...	...
(b) Myocarditis ...	...	3	...	...	3	...	6	...	...
91. Diseases of the Arteries—									
(a) Aneurism ...	...	...	...	...	...	...	...	...	...
(b) Arterio-Sclerosis ...	...	3	...	...	3	...	2	...	...
(c) Other diseases ...	...	2	...	...	2	...	3	...	...
92. Embolism or Thrombosis (non-cerebral) ...	...	1	...	...	1	...	1	...	1
93. Diseases of the Veins—									
Hæmorrhoids...	...	8	...	...	8	...	64	5	...
Varicose Veins...	...	...	...	...	...	...	9	3	...
Phlebitis ...	...	4	...	...	4	...	3	...	...
94. Diseases of the Lymphatic System—									
Lymphangitis...	...	1	...	...	1	...	...	5	...
Lymphadenitis, Bubo (non-specific) ...	...	27	...	...	27	1	42	2	...
95. Hæmorrhage of undetermined cause ...	...	1	...	...	1	...	2	...	...
96. Other affections of the Circulatory System ...	...	1	1	...	2	...	1	...	...
V.—Affections of the Respiratory System.									
97. Diseases of the Nasal Passages—									
Adenoids ...	...	...	...	...	...	...	...	1	...
Polypus ...	...	...	...	..	...	...	4	...	...
Rhinitis ...	1	2	...	...	3	...	27	5	...
Coryza ...	...	7	...	...	7	...	168	14	...
98. Affections of the Larynx—									
Laryngitis ..	...	5	...	...	5	...	25	3	...
99. Bronchitis—									
(a) Acute ...	...	13	...	...	13	1	163	16	...
(b) Chronic ...	...	2	...	...	2	...	16	...	...
100. Broncho-Pneumonia ...	...	1	...	...	1	...	...	...	...
101. Pneumonia—									
(a) Lobar ...	..	1	...	...	1	...	...	1	...
(b) Unclassified ...	...	...	...	...	...	...	...	...	...
102. Pleurisy. Empyema ...	1	6	...	...	7	...	11	...	...
103. Congestion of the Lungs ...	...	...	...	...	...	...	1	...	...
104. Gangrene of the Lungs ...	...	...	...	...	...	...	...	...	...
105. Asthma ...	...	4	...	...	4	1	29	1	...
106. Pulmonary Emphysema ...	...	...	...	...	...	...	...	...	...
107. Other affections of the Lungs—									
Pulmonary Spirochætosis ...	...	...	...	...	...	...	...	...	...
Carried forward ...	18	626	14	12	658	12	2,972	470	7

TABLE IV.—RETURN OF DISEASES AND DEATHS (EUROPEAN)
FOR THE YEAR 1931—*continued.*

Diseases.				IN-PATIENTS.					OUT-PATIENTS.			
				Remaining in Hospital at end of 1930.	TOTAL.			Total cases treated.	Remaining in Hospital at end of 1931.	Male.	Female.	Deaths.
					Admissions.		Deaths.					
					Male.	Female.						
Brought forward				18	626	14	12	658	12	2,972	470	7
VI.— <i>Diseases of the Digestive System.</i>												
108. A.—Diseases of Teeth or Gums—												
Caries, Pyorrhœa, &c. ... ..				...	...	...	...	...	...	168	20	...
B.—Other affections of the Mouth—												
Stomatitis ... ..				...	1	...	...	1	...	41	2	...
Glossitis, &c. ... ..				...	1	...	...	1	...	9	3	...
109. Affections of the Pharynx or Tonsils—												
Tonsillitis ... ..				...	18	1	...	19	...	98	25	...
Pharyngitis ... ..				...	1	...	...	1	...	64	3	...
110. Affections of the Œsophagus ... ..				...	...	...	...	...	...	...	...	...
111. A.—Ulcer of the Stomach ... ..				...	2	...	...	2	...	2	...	...
B.—Ulcer of the Duodenum ... ..				...	7	...	...	7	...	6	2	...
112. Other affections of the Stomach—												
Gastritis ... ..				...	32	...	...	32	...	179	14	...
Dyspepsia, &c. ... ..				...	16	...	...	16	...	248	34	...
113. Diarrhœa and Enteritis—												
Under two years ... ..				...	1	...	...	1	...	11	2	...
114. Diarrhœa and Enteritis—												
Two years and over				1	39	3	1	43	...	149	29	...
Colitis ... ..				...	15	1	...	16	...	91	15	...
Ulceration ... ..				...	...	...	...	...	...	23	10	...
114a. Sprue ... ..				...	...	...	...	...	...	...	...	...
115. Ankylostomiasis ... ..				...	...	...	...	...	...	3	1	...
116. Diseases due to Intestinal Parasites—												
(a) Cestoda (Tænia) ... ..				...	2	...	...	2	...	6	1	...
(b) Trematoda (Flukes) ... ..				...	...	...	...	...	...	3	...	...
(c) Nematoda (other than Ankylostoma)—												
Ascaris ... ..				...	...	...	...	...	...	1	1	...
Trichocephalus dispar ... ..				...	...	...	...	...	...	9	...	...
Trichina ... ..				...	1	...	...	1	...	1	...	...
Dracunculus ... ..				...	...	...	...	...	...	...	1	...
Strongylus ... ..				...	...	...	...	...	...	...	...	...
Oxyuris ... ..				...	...	...	...	...	...	...	...	...
(d) Coccidia ... ..				...	...	...	...	...	...	...	...	...
(e) Other parasites ... ..				...	...	...	...	...	...	8	...	...
(f) Unclassified ... ..				...	1	...	...	1	...	3	1	...
117. Appendicitis				2	31	2	...	35	1	18	2	...
118. Hernia ... ..				...	3	...	...	3	...	13	...	...
119. A.—Affections of the Anus, Fistula, &c. ... ..				...	2	...	...	2	...	8	...	...
B.—Other affections of the Intestines—												
Enteroptosis ... ..				...	1	...	...	1	...	5	3	...
Constipation ... ..				...	6	...	...	6	...	84	22	...
Others ... ..				...	3	...	...	3	...	4	...	...
120. Acute Yellow Atrophy of the Liver ... ..				...	...	...	...	...	...	...	...	...
121. Hydatid of the Liver ... ..				...	...	...	...	...	...	...	...	...
Carried forward				21	809	21	13	851	13	4,227	661	7

TABLE IV.—RETURN OF DISEASES AND DEATHS (EUROPEAN)

FOR THE YEAR 1931—*continued.*

Diseases.				IN-PATIENTS.					OUT-PATIENTS.			
				Remaining in Hospital at end of 1930.	TOTAL		Deaths.	Total cases treated.	Remaining in Hospital at end of 1931.	Male.	Female.	Deaths.
					Admissions.							
					Male.	Female.						
Brought forward				21	809	21	13	851	13	4,227	661	7
VI.— <i>Diseases of the Digestive System</i> —continued.												
122. Cirrhosis of the Liver—												
(<i>a</i>) Alcoholic ... ..				...	...	...	...	...	...	...	...	...
(<i>b</i>) Other forms ... ..				...	...	...	...	...	...	...	...	...
123. Biliary Calculus ... ..				...	...	...	...	...	...	1	...	...
124. Other affections of the Liver—												
Abscess ... ..				...	2	...	2	2	...	...	...	...
Hepatitis ... ..				...	7	...	...	7	1	13	...	...
Cholecystitis... ..				1	2	...	...	3	...	...	...	...
Jaundice				1	9	...	...	10	...	15	...	...
125. Diseases of the Pancreas ... ..				...	1	...	...	1	...	1	...	...
126. Peritonitis (of unknown cause) ... ..				...	...	...	...	...	...	1	...	...
127. Other affections of the Digestive System ... ..				...	3	...	1	3	...	6	1	...
VII.— <i>Diseases of the Genito-urinary System (non-Venereal).</i>												
128. Acute Nephritis ... ..				...	3	...	...	3	...	2	3	...
129. Chronic ... ..				...	...	...	...	...	...	2	...	...
130. A.—Chyluria ... ..				...	...	...	...	...	...	...	...	...
B.—Schistosomiasis ... ..				...	2	...	...	2	...	2	...	...
131. Other affections of the Kidneys—												
Pyelitis, &c. ... ..				...	7	2	...	9	...	9	4	...
132. Urinary Calculus ... ..				...	4	...	...	4	...	6	1	...
133. Diseases of the Bladder—												
Cystitis				1	5	...	...	6	...	52	8	...
134. Diseases of the Urethra—												
(<i>a</i>) Stricture ... ..				...	2	...	...	2	...	6	...	...
(<i>b</i>) Other ... ..				...	2	...	...	2	...	42	...	...
135. Diseases of the Prostate—												
Hypertrophy ... ..				...	...	...	...	...	...	2	...	...
Prostatitis ... ..				...	1	...	...	1	...	22	...	...
136. Diseases (non-Venereal) of the Genital Organs of Man—												
Epididymitis ... ..				...	5	...	...	5	...	11	...	...
Orchitis ... ..				...	7	...	...	7	...	10	...	...
Hydrocele ... ..				...	...	...	...	...	...	2	...	...
Ulcer of Penis				1	3	...	...	4	...	21	...	...
137. Cysts or other non-malignant Tumours of the Ovaries ... ..				...	...	...	...	...	...	2	1	...
138. Salpingitis—												
Abscess of the Pelvis ... ..				...	1	2	...	3	...	...	...	...
139. Uterine Tumours (non-malignant) ... ..				...	1	...	...	1	...	...	...	...
140. Uterine Hæmorrhage (non-puerperal) ... ..				...	2	...	...	2	...	...	1	...
141. A.—Metritis				1	...	2	...	3	...	...	2	...
B.—Other affections of the Female Genital Organs—												
Displacements of Uterus ... ..				...	...	2	...	2	1	...	6	...
Amenorrhœa ... ..				...	...	2	...	2	...	...	14	...
Dysmenorrhœa ... ..				...	...	2	...	2	...	...	13	...
Leucorrhœa ... ..				...	...	...	...	...	...	...	...	...
Carried forward				26	878	33	16	937	15	4,455	715	7

TABLE IV.—RETURN OF DISEASES AND DEATHS (EUROPEAN)
FOR THE YEAR 1931—*continued*.

Diseases.	Remaining in Hospital at end of 1930.	IN-PATIENTS.					Remaining in Hospital at end of 1931.	OUT-PATIENTS.		
		TOTAL.			Total cases treated.	Male.		Female.	Deaths	
		Admissions.		Deaths.						
		Male.	Female.							
Brought forward	26	878	33	16	937	15	4,455	715	7	
VII.— <i>Diseases of the Genito-urinary System (non-Venereal)</i> —contd.										
142. Diseases of the Breast (non-puerperal)—										
Mastitis ... ..	...	...	3	...	3	...	...	9	...
Abscess of Breast ... ..	...	...	1	...	1	...	...	3	...
VIII.— <i>Puerperal State.</i>										
143. A.—Normal Labour ... ..	...	...	5	...	5	...	...	5	...
B.—Accidents of Pregnancy—										
(a) Abortion ... ..	...	...	5	...	5	1	...	9	...
(b) Ectopic Gestation ... ..	...	...	...	...	...	...	...	...	...
(c) Other accidents of Preg- nancy ... ..	...	...	3	...	3	...	...	21	...
144. Puerperal Hæmorrhage ... ..	...	...	...	...	...	...	...	...	...
145. Other accidents of Parturition	...	...	...	...	...	...	...	...	...
146. Puerperal Septicæmia ... ..	...	...	...	...	...	...	...	...	...
147. Phlegmasia Dolens ... ..	...	...	...	...	...	...	...	...	...
148. Puerperal Eclampsia ... ..	...	...	...	...	...	...	...	...	...
149. Sequelæ of Labour ... ..	...	...	...	...	...	...	...	...	...
150. Puerperal affections of the Breast ... ..	...	...	...	...	...	...	...	...	...
IX.— <i>Affections of the Skin and Cellular Tissues.</i>										
151. Gangrene ... ..	...	1	...	...	1	...	4	...	...
152. Boil ... ..	...	30	1	...	31	...	231	10	...
Carbuncle	2	6	...	...	8	...	64	4	...
153. Abscess	1	25	5	...	31	...	54	4	...	
Whitlow ... ..	...	11	...	...	11	...	25	8	...
Cellulitis	4	17	1	...	22	1	144	14	...	
154. A.—Tinea ... ..	...	4	...	...	4	...	204	9	...
B.—Scabies ... ..	...	1	...	...	1	...	29	2	...
155. Other Diseases of the Skin—										
Brythema ... ..	...	1	...	...	1	...	30	1	...
Urticaria ... ..	...	4	...	...	4	...	47	15	...
Eczema ... ..	...	5	...	...	5	...	137	20	...
Herpes ... ..	...	1	...	...	1	...	22	...	...
Psoriasis ... ..	...	1	...	...	1	...	10	1	...
Elephantiasis ... ..	...	...	...	...	...	...	3	...	...
Myiasis ... ..	...	...	...	...	...	...	12	4	...
Chigoes ... ..	...	...	...	...	...	...	19	1	...
Cutaneous Leishmaniasis ... ..	...	...	...	...	...	...	...	...	...
X.— <i>Diseases of Bones and Organs of Locomotion (other than Tuberculous).</i>										
156. Diseases of Bones--										
Osteitis	1	4	...	...	5	...	156	2	...
157. Diseases of Joints—										
Arthritis	1	7	...	...	8	...	24	...	...
Synovitis ... ..	...	10	...	...	10	...	47	2	...
158. Other Diseases of Bones or Organs of Locomotion ... ..	...	3	...	...	3	...	21	1	...
Carried forward	35	1,009	57	16	1,101	17	5,738	860	7	

TABLE IV.—RETURN OF DISEASES AND DEATHS (EUROPEAN)

FOR THE YEAR 1931—continued.

Diseases.	IN-PATIENTS.							OUT-PATIENTS.		
	Remaining in Hospital at end of 1930.	TOTAL.			Total cases treated.	Remaining in Hospital at end of 1931.	Male.	Female.	Deaths.	
		Admissions.		Deaths.						
		Male.	Female.							
Brought forward	35	1,009	57	16	1,101	17	5,738	860	7	
XI.—Malformations.										
159. Malformations—										
Hydrocephalus	6	1	...	
Hypospadias...	
Spina Bifida, etc.	
XII.—Diseases of Infancy.										
160. Congenital Debility	
161. Premature Birth	
162. Other affections of infancy	
163. Infant neglect (infants of three months or over)	
XIII.—Affections of Old Age.										
164. Senility—										
Senile Dementia	
XIV.—Affections produced by External Causes.										
165. Suicide by Poisoning	
166. Corrosive Poisoning (Inten- tional)	
167. Suicide by Gas Poisoning	
168. Suicide by Hanging or Stran- gulation	
169. Suicide by Drowning	
170. Suicide by Firearms	
171. Suicide by cutting or stabbing instruments	
172. Suicide by jumping from a height	
173. Suicide by crushing	
174. Other Suicides	
175. Food Poisoning	8	1	...	9	...	9	2	...	
Botulism	1	...	
176. Attacks of poisonous animals										
Snake Bite	3	...	...
Insect Bite	42	9	...	
177. Other accidental Poisonings	1	...	...
178. Burns (by Fire)	2	...	...	2	...	22	1	...	
179. Burns (other than by Fire)	3	...	...	3	...	7	1	...	
180. Suffocation (accidental)	
181. Poisoning by Gas (accidental)	
182. Drowning (accidental)	
183. Wounds (by Firearms, war excepted)	6	...	...	6	...	3	...	...
184. Wounds (by cutting or stabbing instruments)	1	...	...	1	...	24	4	...	
185. Wounds (by Fall)	34	...	...	34	...	187	8	...	
186. Wounds (in Mines or Quarries)	
187. Wounds (by Machinery)	2	...	...	2	...	8	...	...
188. Wounds (crushing, e.g. railway accidents, &c.)	1	...	...	1	...	2	...	...
Carried forward	35	1,066	58	16	1,159	17	6,052	887	7	

TABLE IV.—RETURN OF DISEASES AND DEATHS (EUROPEAN)
FOR THE YEAR 1931—*continued.*

Diseases.	Remaining in Hospital at end of 1930.	IN-PATIENTS.					Remaining in Hospital at end of 1931.	OUT-PATIENTS.		
		TOTAL.			Total cases treated.	Male.		Female.	Deaths.	
		Admissions.		Deaths.						
		Male.	Female.							
Brought forward	35	1,066	58	16	1,159	17	6,052	887	2	
XIV.— <i>Affections produced by External Causes—contd.</i>										
189. Injuries inflicted by Animals, Bites, Kicks, &c.	5	...	...	5	...	46	...	...
190. Wounds inflicted on Active Service	
191. Executions of civilians by belligerents	
192. A.—Over fatigue	2	...	...	2	...	2	...	...
B.—Hunger or Thirst	1	...	...	...	1	...	...	...	...
193. Exposure to Cold, Frost bite, &c.	
194. Exposure to Heat— Heatstroke	1	...	...	1	...	10	3	..	
Sunstroke	1	...	...	1	...	3	1	...	
195. Lightning Stroke	
196. Electric Shock	
197. Murder by Firearms	
198. Murder by cutting or stabbing instruments	
199. Murder by other means	
200. Infanticide (Murder of an infant under one year)	
201. A.—Dislocation	2	...	...	2	...	6	...	...
B.—Sprain	8	...	...	8	...	91	3	...	
C.—Fracture	24	...	2	24	1	34	1	...	
202. Other External Injuries	2	13	1	...	16	1	202	18	...	
203. Deaths by Violence of un- known cause	2	...	2	
XV.— <i>Ill-Defined Diseases.</i>										
204. Sudden Death (cause unknown)	
205. A.—Diseases not already speci- fied or ill-defined—										
Ascites	7	...	...	7	...	10	...	...
Œdema	3	...	...	3	...	5	...	...
Asthenia	7	...	...	7	...	131	14	...	
Shock	1	...	...	1	...	9	1	...	
Hyperpyrexia	1	...	...	1	...	2	...	...
B.—Malingering	1	...	...	1	...	...	...	...
P. U. O.	1	...	...	...	1	...	...	...	...
XVI.— <i>Diseases, the total of which have not caused 10 Deaths—</i>										
Ulcers	3	2	...	...	...	92	5	...	
Total	39	1,145	61	18	1,245	19	6,697	933	9	

TABLE V.

RETURN OF DISEASES AND DEATHS (NON-EUROPEAN)
FOR THE YEAR 1931.

Diseases.	IN-PATIENTS.						OUT-PATIENTS.		
	Remaining in Hospital at end of 1930.	TOTAL.			Total cases treated.	Remaining in Hospital at end of 1931.	Male.	Female.	Deaths.
		Admissions.		Deaths.					
		Male.	Female.						
I.—Epidemic, Endemic, and Infectious Diseases.									
1. Enteric Group—									
(a) Typhoid Fever ... ..	...	8	1	5	9	...	2	...	...
(b) Paratyphoid A. ... ..	...	2	...	...	2	...	...	...	...
(c) Paratyphoid B. ... ..	...	...	...	...	...	...	...	...	...
(d) Type not defined	2	3	1	2	6	...	1	...	...
2. Typhus ... ..	...	1	...	1	1	...	...	...	...
3. Relapsing Fever	14	40	19	4	73	...	18	1	...
4. Undulant Fever ... ..	...	1	...	...	1	...	1	...	...
5. Malaria—									
(a) Tertian	2	25	3	1	30	...	968	254	...
(b) Quartan ... ..	...	29	2	1	31	...	4	2	...
(c) Aestivo-autumnal	27	1,545	233	32	1,805	18	22,913	9,742	...
(d) Cachexia ... ..	...	10	1	5	11	...	34	6	1
(e) Blackwater ... ..	...	7	4	1	11	...	1	...	...
6. Smallpox	5	109	76	39	190	1	778	637	325
Alastrim ... ..	...	9	1	3	10	...	10	2	...
7. Measles	2	20	2	...	24	1	34	16	...
8. Scarlet Fever ... ..	...	...	1	...	1	...	7	4	...
9. Whooping Cough ... ..	...	6	1	...	7	...	172	157	1
10. Diphtheria ... ..	...	...	...	...	...	...	8	...	...
11. Influenza	6	232	57	11	295	...	1,332	268	...
12. Miliary Fever ... ..	...	3	...	...	3	...	1	1	...
13. Mumps ... ..	...	34	2	...	36	...	294	88	...
14. Cholera ... ..	...	...	...	...	...	...	17	2	...
15. Epidemic diarrhoea ... ..	...	2	...	...	2	...	9	1	...
16. Dysentery—									
(a) Amœbic	4	432	146	79	582	11	1,791	607	2
(b) Bacillary	2	88	10	21	100	1	26	2	...
(c) Undefined or due to other causes	6	215	26	25	247	3	668	202	...
17. Plague—									
(a) Bubonic ... ..	...	...	...	...	...	...	...	...	...
(b) Pneumonic ... ..	...	...	...	...	...	...	...	...	...
(c) Septicæmic ... ..	...	...	...	...	...	...	...	...	...
(d) Undefined ... ..	...	...	...	...	...	...	7	3	...
18. Yellow Fever ... ..	...	9	...	...	9	1	1	3	...
19. Spirochaetosis ictero-hæmorrhagica ... ..	...	...	...	...	...	...	...	...	...
20. Leprosy	539	83	20	12	642	6	1,596	655	3
21. Erysipelas ... ..	...	6	2	...	8	...	5	3	...
22. Acute Poliomyelitis ... ..	...	...	4	...	4	...	3	3	...
23. Encephalitis Lethargica ... ..	...	1	3	...	4	...	6	4	...
24. Epidemic Cerebro-spinal Fever ... ..	...	9	2	9	11	...	...	...	...
25. Other Epidemic Diseases—									
(a) Rubella (German Measles) ... ..	...	...	...	...	...	...	13	10	...
(b) Varicella (Chicken-pox)	12	482	40	...	534	13	417	39	...
(c) Kala-azar ... ..	...	...	...	...	...	...	...	...	...
(d) Phlebotomus Fever ... ..	...	1	...	...	1	...	1	...	...
(e) Dengue ... ..	...	2	...	...	2	...	2	...	...
(f) Epidemic Dropsy ... ..	...	1	...	...	1	...	14	5	...
(g) Yaws	7	448	62	6	517	2	31,331	24,498	11
(h) Trypanosomiasis	74	912	244	57	1,230	72	1,676	560	...
Carried forward	702	4,775	963	314	6,440	129	64,161	37,775	343

TABLE V.—RETURN OF DISEASES AND DEATHS (NON-EUROPEAN)
FOR THE YEAR 1931—continued.

Diseases.		IN-PATIENTS.						OUT-PATIENTS.		
		Remaining in Hospital at end of 1930.	TOTAL.		Deaths.	Total cases treated.	Remaining in Hospital at end of 1931.	Male.	Female.	Deaths.
			Admissions.							
			Male.	Female.						
Brought forward		702	4,775	963	314	6,440	129	64,161	37,775	343
I.—Epidemic, Endemic, and Infectious Diseases—contd.										
26.	Glanders ... ..	...	...	...	...	...	...	...	...	...
27.	Anthrax ... ..	...	1	...	...	1	...	...	...	...
28.	Rabies ... ..	...	6	...	3	6	...	7	5	...
29.	Tetanus	3	35	7	22	45	...	12	6	1
30.	Mycosis	3	6	...	1	9	1	17	12	...
31.	Tuberculosis, Pulmonary and Laryngeal	16	236	52	118	304	17	242	107	4
32.	Tuberculosis of the Meninges or Central Nervous System ... ..	...	4	...	2	4	...	10	5	...
33.	Tuberculosis of the Intestines or Peritoneum	1	13	1	6	15	...	6	2	...
34.	Tuberculosis of the Vertebral Column	2	29	6	4	37	4	19	13	...
35.	Tuberculosis of Bones and Joints	7	22	3	4	32	2	26	17	...
36.	Tuberculosis of other organs—									
	(a) Skin or Subcutaneous Tissue (Lupus)	1	7	1	1	9	1	10	3	...
	(b) Bones	3	11	...	...	14	...	9	2	...
	(c) Lymphatic System	3	32	4	1	39	4	87	46	...
	(d) Genito-urinary ... ..	...	...	...	...	...	...	...	...	...
	(e) Other Organs ... ..	...	20	1	9	21	3	8	9	...
37.	Tuberculosis disseminated—									
	(a) Acute ... ..	...	2	...	...	2	...	2	1	...
	(b) Chronic ... ..	...	...	...	...	...	...	...	...	...
38.	Syphilis—									
	(a) Primary	19	353	37	1	409	18	2,737	876	...
	(b) Secondary	27	556	59	7	642	23	1,611	782	...
	(c) Tertiary	18	232	21	21	271	15	6,138	3,171	1
	(d) Hereditary	2	10	4	4	16	2	56	44	...
	(e) Period not indicated	9	83	10	8	102	7	356	185	1
39.	Soft Chancre	6	136	3	1	145	9	543	63	...
40.	A.—Gonorrhœa and its complica- tions	45	796	114	29	955	39	10,452	1,120	...
	B.—Gonorrhœal Ophthalmia	1	65	20	...	86	4	153	83	...
	C.—Gonorrhœal Arthritis	1	123	15	5	139	5	662	66	...
	D.—Granuloma Venereum	2	24	4	...	30	4	21	6	...
41.	Septicæmia	2	34	8	23	44	...	5	5	...
42.	Other Infectious Diseases ... ..	...	1	...	...	1	...	16	1	...
II.—General Diseases not mentioned above.										
43.	Cancer or other malignant Tumours of the Buccal Cavity ... ..	...	4	1	...	5	...	10	6	...
44.	Cancer or other malignant Tumours of the Stomach or Liver ... ..	...	15	5	9	20	...	7	2	...
45.	Cancer or other malignant Tumours of the Peritoneum intestines, Rectum ... ..	...	7	...	3	7	...	1	...	...
46.	Cancer or other malignant Tumours of the Female Genital Organs	1	...	9	...	10	...	...	4	...
47.	Cancer or other malignant Tumours of the Breast	1	3	...	...	4	...	...	3	...
48.	Cancer or other malignant Tumours of the Skin	1	13	3	1	17	2	24	7	...
Carried forward		876	7,654	1,351	597	9,881	289	87,408	44,427	350

TABLE V.—RETURN OF DISEASES AND DEATHS (NON-EUROPEAN)
FOR THE YEAR 1931—*continued*.

Diseases.	IN-PATIENTS.						OUT-PATIENTS.		
	Remaining in Hospital at end of 1930.	TOTAL.			Total cases treated.	Remaining in Hospital at end of 1931.	Male.	Female.	Deaths.
		Admissions.		Deaths.					
		Male.	Female.						
Brought forward	876	7,654	1,351	597	9,881	289	87,408	44,427	350
II.—General Diseases not mentioned above—contd.									
49. Cancer or other malignant Tumours of Organs not specified	1	46	11	12	58	4	20	7	...
50. Tumours non-Malignant	11	325	76	18	412	19	1,425	155	1
51. Acute Rheumatism	3	224	28	4	255	1	4,197	1,524	...
52. Chronic Rheumatism	18	318	39	8	375	11	14,085	5,812	...
53. Scurvy (including Barlow's Disease) ... ..	...	2	...	2	2	...	2	...	...
54. Pellagra ... ..	...	...	...	...	...	...	...	...	...
55. Beri-Beri ... ..	...	11	...	3	11	2	3	1	...
56. Rickets ... ..	...	8	...	1	8	1	42	20	...
57. Diabetes (not including Insipidus)	1	11	5	3	17	1	13	8	...
58. Anæmia :—									
(a) Pernicious	2	23	8	6	33	...	321	248	...
(b) Other Anæmias and Chloro- sis	4	59	12	9	75	4	374	357	...
59. Diseases of the Pituitary Body ...	...	1	...	...	1	...	...	...	...
60. Diseases of the Thyroid Gland ...	...	...	...	...	...	...	...	...	...
(a) Exophthalmic Goitre ... ..	...	14	19	5	33	1	59	61	...
(b) Other diseases of the Thy- roid Gland, Myxædema ... ..	...	38	5	1	43	...	80	98	...
61. Diseases of the Para-Thyroid Glands ... ..	...	...	...	...	...	...	1	...	...
62. Diseases of the Thymus ... ..	...	...	...	...	...	...	...	...	...
63. Diseases of the Supra-Renal Glands ... ..	...	...	...	...	...	...	...	...	...
64. Diseases of the Spleen	8	61	10	5	79	2	1,568	979	...
65. Leukæmia :—									
(a) Lenkæmia ... ..	...	7	1	...	8	...	5	4	...
(b) Hodgkin's Disease ... ..	...	6	...	...	6	1	2	...	...
66. Alcoholism ... ..	...	10	...	...	10	...	1	1	...
67. Chronic poisoning by mineral sub- stances (lead, mercury, &c.) ...	...	1	...	...	1	...	1	...	...
68. Chronic poisoning by organic sub- stances (Morphia, Cocaine, &c.) ...	...	1	...	...	1	...	...	...	...
69. Other General Diseases :—									
Auto-intoxication ... ..	...	...	...	...	...	...	5	...	...
Purpura Hæmorrhagica ... ..	...	...	...	...	...	...	...	...	...
Hæmophilia ... ..	...	1	...	...	1	...	1	...	...
Diabetes Insipidus ... ..	...	...	...	...	...	...	3	2	...
III.—Affections of the Nervous System and Organs of the Senses.									
70. Encephalitis (not including En- cephalitis Lethargica) ... ..	...	9	1	2	10	...	4	...	...
71. Meningitis (not including Tuber- culous Meningitis or Cerebro- spinal Meningitis) ... ..	...	17	4	15	21	1	1	...	...
72. Locomotor Ataxia	2	9	...	...	11	...	7	3	...
73. Other affections of the Spinal Cord	1	22	...	6	23	2	11	10	...
Carried forward	927	8,878	1,570	697	11,375	339	108,639	53,717	351

TABLE V.—RETURN OF DISEASES AND DEATHS (NON-EUROPEAN)
FOR THE YEAR 1931—*continued*.

Diseases.				IN-PATIENTS.					OUT-PATIENTS.				
				Remaining in Hospital at end of 1930.	TOTAL.		Deaths.	Total Cases treated.	Remaining in Hospital at end of 1931.	Male.	Female.	Deaths.	
					Admissions.								
					Male.	Female.							
Brought forward				927	8,878	1,570	697	11,375	339	108,639	53,717	351	
III.— <i>Affections of the Nervous System and Organs of the Senses—contd.</i>													
74. Apoplexy:—													
(a) Hæmorrhage ... ..				...	18	1	12	19	...	3	2	...
(b) Embolism ... ..				...	2	...	2	2	...	...	...	...
(c) Thrombosis ... ..				...	4	2	2	6	...	...	3	...
75. Paralysis:—													
(a) Hemiplegia				3	35	15	6	53	4	66	16	1	
(b) Other Paralyzes				12	90	14	17	116	14	123	38	...	
76. General Paralysis of the Insane				...	2	1	1	3	...	9	1	...	
77. Other forms of mental Alienation				124	218	11	20	353	144	62	22	...	
78. Epilepsy				3	104	12	4	119	1	277	114	1	
79. Eclampsia, Convulsions (nonpuer- peral) 5 years or over ... ..				...	4	7	...	11	...	24	5	...
80. Infantile Convulsions ... ..				...	8	2	4	10	...	33	28	2
81. Chorea ... ..				...	...	...	...	...	...	1	1	...
82. A.—Hysteria ... ..				...	5	6	...	11	...	118	23	...
B.—Neuritis				1	63	9	...	73	5	1,568	405	...	
C.—Neurasthenia				3	21	...	...	24	2	157	55	...
83. Cerebral Softening				1	4	...	2	5	...	5	1	...	
84. Other affections of the Nervous System, such as Paralysis Agitans				1	24	2	1	27	1	135	40	...	
85. Affections of the Organs of Vision:—													
(a) Diseases of the eye				11	91	19	2	121	5	1,107	281	...	
(b) Conjunctivitis				8	222	65	...	295	8	6,230	2,864	...	
(c) Trachoma ... ..				...	10	8	...	18	1	273	97	...
(d) Tumours of the Eye				1	7	...	...	8	...	38	12	...
(e) Other affections of the Eye				5	118	28	1	151	4	1,341	467	...	
86. Affections of the Ear or Mastoid Sinus				1	86	19	...	106	4	6,662	2,812	...	
IV.— <i>Affections of the Circulatory System.</i>													
87. Pericarditis				1	10	...	4	11	1	6
88. Acute Endocarditis or Myocarditis				3	40	9	13	52	1	85	23	1	
89. Angina Pectoris				2	...	...	...	2	...	2	...	...
90. Other Diseases of the Heart:—													
(a) Valvular:—													
Mitral				2	25	4	7	29	7	69	20	...	
Aortic ... ..				...	82	19	26	103	8	227	120	1
Tricuspid ... ..				...	43	7	16	50	1	57	21	...
Pulmonary ... ..				...	1	...	...	1	...	1	...	...
(b) Myocarditis				2	1	...	...	1	...	6	2	...
Others				1	49	7	16	58	3	123	55	...	
91. Diseases of the Arteries:—													
(a) Aneurism ... ..				...	26	4	10	30	1	53	17	...
(b) Arterio-Sclerosis ... ..				...	6	...	1	6	...	23	9	...
(c) Other diseases ... ..				...	4	...	...	4	...	9	5	...
92. Embolism or Thrombosis (non- cerebral) ... ..				...	1	...	1	1	...	1	...	...
Carried forward				1,112	10,302	1,841	865	13,255	554	128,533	61,276	357	

TABLE V.—RETURN OF DISEASES AND DEATHS (NON-EUROPEAN) FOR
THE YEAR 1931—*continued*.

Diseases.	IN-PATIENTS.							OUT-PATIENTS.		
	Remaining in Hospital at end of 1930.	TOTAL.			Total cases treated.	Remaining in Hospital at end of 1931.	Male.	Female.	Deaths.	
		Admissions.		Deaths.						
		Male.	Female.							
Brought forward	1,112	10,302	1,841	865	13,255	554	128,533	61,276	357	
IV.— <i>Affections of the Circulatory System—contd.</i>										
93. Diseases of the Veins:—										
Hæmorrhoids	2	135	13	1	150	1	621	191	..	
Varicose Veins ... ..	...	7	...	...	7	...	62	22	...
Phlebitis	1	6	1	...	8	...	6	2	...	
94. Diseases of the Lymphatic System—										
Lymphangitis	1	40	...	...	41	5	211	53	...
Lymphadenitis, Bubo (non-specific)	21	502	31	3	554	20	2,003	396	...	
95. Hæmorrhage of undetermined cause										
... ..	...	6	6	1	12	...	19	4	...
96. Other affections of the Circulatory System										
... ..	1	4	2	1	7	1	17	5	...	
V.— <i>Affections of the Respiratory System.</i>										
97. Diseases of the Nasal Passages—										
Adenoids ... ..	...	11	1	...	12	...	25	12	...
Polypus ... ..	...	5	...	...	5	...	28	14	...
Rhinitis ... ..	...	3	...	1	3	...	154	54	...
Coryza ... ..	...	155	4	...	159	4	3,158	1,323	...
98. Affections of the Larynx—										
Laryngitis ... ..	...	13	3	...	16	1	355	194	...
99. Bronchitis—										
(a) Acute	10	748	135	40	893	9	17,608	7,049	5	
(b) Chronic	8	144	16	8	168	5	5,120	1,933	...	
100. Broncho-Pneumonia										
... ..	10	233	38	88	281	9	304	186	...	
101. Pneumonia—										
(a) Lobar	24	586	82	180	692	29	200	53	1	
(b) Unclassified	5	168	17	35	190	1	143	29	...	
102. Pleurisy, Empyema										
... ..	2	143	15	19	160	2	389	95	..	
103. Congestion of the Lungs										
... ..	...	40	3	6	43	...	167	95	..
104. Gangrene of the Lungs										
... ..	...	4	...	2	4	...	4	...	...
105. Asthma										
... ..	4	62	8	4	74	2	203	40	...	
106. Pulmonary Emphysema										
... ..	...	4	...	1	4	...	1	2	...
107. Other affections of the Lungs—										
Pulmonary Spirochaetosis ... ..	...	12	1	2	13	1	15	2	...
VI.— <i>Diseases of the Digestive System.</i>										
108. A.—Diseases of Teeth or Gums—										
Caries, Pyorrhœa, &c. ... ..	...	32	8	1	40	...	4,354	1,733	1
B.—Other affections of the Mouth—										
Stomatitis ... ..	...	49	20	8	69	4	1,390	699	...
Glossitis, &c.	1	11	1	1	13	...	960	194	...	
109. Affections of the Pharynx or Tonsils—										
Tonsillitis	1	83	6	4	90	1	930	494	1	
Pharyngitis	1	17	5	3	23	...	529	146	...	
Carried forward	1,204	13,525	2,257	1,274	16,986	649	167,509	76,290	365	

TABLE V.—RETURN OF DISEASES AND DEATHS (NON-EUROPEAN) FOR
THE YEAR 1931—continued.

Diseases.				IN-PATIENTS.					OUT-PATIENTS.				
				Remaining in Hospital at end of 1930.	TOTAL.		Deaths.	Total cases treated.	Remaining in Hospital at end of 1931.	Male.	Female.	Deaths.	
					Admissions.								
					Male.	Female.							
Brought forward ...				1,204	13,525	2,257	1,274	16,986	649	167,509	76,290	365	
VI.--Diseases of the Digestive System--contd.													
110.	Affections of the Œsophagus ...			..	1	...	...	1	...	4	...	...
111.	A.--Ulcer of the Stomach ...			...	7	2	2	9	...	9	2	...
	B.--Ulcer of the Duodenum ...			...	7	...	...	7	...	6	2	...
112.	Other affections of the Stomach--												
	Gastritis			1	102	12	8	115	1	1,405	744	...	
	Dyspepsia, &c.			2	82	19	3	103	2	3,516	1,711	...	
113.	Diarrhœa and Enteritis												
	Under two years ... ..			...	85	21	5	106	...	1,762	897	1
114.	Diarrhœa and Enteritis--												
	Two years and over			11	482	49	34	542	5	1,911	1,241	1	
	Colitis			4	69	11	4	84	2	1,460	375	2	
	Ulceration ... ..			...	3	...	...	3	...	94	35	...
114a.	Sprue ... ..			...	3	...	...	3	...	...	...	...
115.	Ankylostomiasis			10	174	44	30	228	10	1,240	723	...	
116.	Diseases due to Intestinal Parasites--												
	(a) Cestoda (Tænia)			1	39	9	...	49	1	5,754	1,254	...	
	(b) Trematoda (Flukes) ...			1	2	...	1	3	...	42	15	...	
	(c) Nematoda (other than												
	Ankylostoma) ... ..			...	5	...	...	5	...	105	43	...
	Ascaris			3	84	12	1	99	3	9,798	7,931	...	
	Trichocephalus dispar ...			...	...	...	...	...	...	13	3	...
	Trichina ... ..			...	...	...	...	...	...	42	25	...
	Dracunculus			11	389	65	15	465	10	2,198	386	...	
	Strongylus ... ..			...	...	...	...	...	...	22	2	...
	Oxyuris ... ..			...	1	...	...	1	...	45	19	...
	(d) Coccidia ... ..			...	...	...	...	...	...	5	...	...
	(e) Other parasites ... ..			...	5	3	2	8	...	58	134	1
	(f) Unclassified ... ..			...	4	9	...	13	...	1,265	1,395	...
117.	Appendicitis			2	32	7	4	41	4	17	7	...	
118.	Hernia			69	1,787	38	75	1,894	64	1,485	92	2	
119.	A.--Affections of the Anus,												
	Fistula, &c.			10	128	15	5	153	10	167	60	...	
	B.--Other affections of the												
	Intestines--												
	Enteroptosis ... ..			...	4	1	2	5	...	10	7	...
	Constipation ... ..			...	130	27	2	157	1	22,920	6,887	...
	Others ... ..			...	25	2	7	27	2	3	3	...
120.	Acute Yellow Atrophy of the												
	Liver ... ..			...	...	...	...	...	...	...	1	1
121.	Hydatid of the Liver ... ..			...	...	...	...	...	...	...	...	...
122.	Cirrhosis of the Liver--												
	(a) Alcoholic ... ..			...	4	...	2	4	...	7	4	...
	(b) Other forms			2	34	4	7	40	7	6	1	...	
123.	Biliary Calculus ... ..			...	2	...	...	2	...	2	...	...
124.	Other affections of the Liver--												
	Abscess			3	72	6	19	81	4	65	14	1	
	Hepatitis			3	71	4	10	78	2	120	52	1	
	Cholecystitis ... ..			...	10	1	...	11	...	12	3	...
	Jaundice			2	70	12	9	84	...	164	55	...	
Carried forward				1,339	17,438	2,630	1,521	21,407	777	223,241	100,413	375	

TABLE V.—RETURN OF DISEASES AND DEATHS (NON-EUROPEAN) FOR
THE YEAR 1931—*continued.*

Diseases.				IN-PATIENTS.					OUT-PATIENTS.			
				Remaining in Hospital at end of 1930.	TOTAL.			Total cases treated.	Remaining in Hospital at end of 1931.	Male.	Female.	Deaths.
					Admissions.		Deaths.					
					Male.	Female.						
Brought forward				1,339	17,438	2,630	1,521	21,407	777	223,241	100,413	375
VI.— <i>Diseases of the Digestive System—(contd.)</i>												
125.	Diseases of the Pancreas... ..			...	6	...	1	6	...	4	1	...
126.	Peritonitis (cf unknown cause) ...			1	43	10	15	54	1	9	3	...
127.	Other affections of the Digestive System ... ..			...	9	4	5	13	...	72	43	...
VII.— <i>Diseases of the Genito-urinary System (non-Venereal)</i>												
128.	Acute Nephritis			1	126	29	48	156	...	134	52	2
129.	Chronic			4	45	9	15	58	2	85	29	...
130.	A. - Chyluria ... ..			...	...	...	...	...	...	2	1	...
	B.—Schistosomiasis			2	80	10	2	92	1	296	20	...
131.	Other affections of the Kidneys— Pyelitis, &c. ... ..			...	23	2	6	25	2	27	18	...
132.	Urinary Calculus ... ..			...	5	...	...	5	...	6	...	...
133.	Diseases of the Bladder— Cystitis			4	67	18	1	89	1	557	259	...
134.	Diseases of the Urethra— (a) Stricture			11	293	5	16	309	15	461	7	...
	(b) Other			2	62	24	6	88	3	466	63	...
135.	Diseases of the Prostate— Hypertrophy ... ..			...	2	1	...	3	...	1	...	...
	Prostatitis ... ..			...	11	...	1	11	...	22	...	...
136.	Diseases (non-Venereal) of the Genital Organs of Man—											
	Epididymitis ... ..			...	90	...	...	90	4	403	...	...
	Orchitis			3	192	...	2	195	7	527	...	...
	Hydrocele			34	617	...	8	651	9	446	...	...
	Ulcer of Penis			3	161	...	1	164	1	572	...	...
	Others			14	...	...	...	14	...	...	...	...
137.	Cysts or other non-malignant Tumours of the Ovaries			4	...	47	4	51	4	...	64	...
138.	Salpingitis— Abscess of the Pelvis ... ..			...	...	66	2	66	4	...	153	...
	Others			2	...	...	...	2	...	...	...	...
139.	Uterine Tumours (non-malignant)			1	...	50	5	51	5	...	56	...
140.	Uterine Hæmorrhage (non-puer- peral) ... ..			...	...	12	...	12	...	...	92	2
141.	A.—Metritis			2	...	68	...	70	...	...	209	...
	B.—Other affections of the Female Genital Organs—											
	Displacements of Uterus			4	...	173	6	177	...	...	461	...
	Amenorrhœa ... ..			...	...	6	...	6	...	...	485	...
	Dysmenorrhœa			2	...	40	...	42	1	...	1,191	...
	Leucorrhœa			1	...	19	...	20	...	...	979	...
	Others			1	...	...	...	1	...	...	...	...
142.	Diseases of the Breast (non-puer- peral)—											
	Mastitis			1	2	49	...	52	3	17	326	...
	Abscess of Breast ... ..			...	3	35	2	38	1	1	74	...
Carried forward				1,436	19,275	3,307	1,667	24,018	841	227,349	104,999	379

TABLE V.—RETURN OF DISEASES AND DEATHS (NON-EUROPEAN) FOR
THE YEAR 1931—*continued*.

Diseases.					IN-PATIENTS.					OUT-PATIENTS.				
					Remaining in Hospital at end of 1930.	TOTAL.			Total cases treated.	Remaining in Hospital at end of 1931.	Male.	Female.	Deaths.	
						Admissions.		Deaths.						
						Male.	Female.							
Brought forward					1,436	19,275	3,307	1,667	24,018	841	227,349	104,999	379	
VIII.— <i>Puerperal State.</i>														
143.	A.—Normal Labour				6	...	372	2	378	4	...	107	...	
	B.—Accidents of Pregnancy—													
	(a) Abortion				2	...	94	1	96	1	...	297	2	
	(b) Ectopic Gestation ... ..				...	1	2	...	3	...	...	10	...
	(c) Other accidents of Preg- nancy... ..				...	...	103	14	103	...	...	355	...
144.	Puerperal Hæmorrhage ... ..				...	...	3	...	3	...	...	3	...
145.	Other accidents of Parturition ...				2	...	65	14	67	2	...	25	1	
146.	Puerperal Septicæmia ... ..				...	...	15	6	15	1	...	4	...
147.	Phlegmasia Dolens... ..				...	...	1	...	1	...	...	...	...
148.	Puerperal Eclampsia ... ..				...	...	3	...	3	...	...	...	...
149.	Sequelæ of Labour				3	...	26	3	29	...	...	73	...
150.	Puerperal affections of the Breast				...	...	6	...	6	...	...	1	...
IX.— <i>Affections of the Skin and Cellular Tissues.</i>														
151.	Gangrene				3	33	10	9	46	4	72	29	...	
152.	Boil				1	66	6	...	73	...	2,770	704	...	
	Carbuncle				2	22	6	...	30	...	353	136	...	
153.	Abscess				48	901	104	45	1,053	29	3,412	830	1	
	Whitlow				9	109	21	1	139	3	1,734	590	...	
	Cellulitis				29	653	97	13	779	26	3,304	1,118	...	
154.	A.—Tinea				5	45	19	...	69	1	8,216	1,584	...	
	B.—Scabies				2	74	6	...	82	...	9,924	2,994	...	
155.	Other Diseases of the Skin—													
	Brythema... ..				...	31	3	...	34	3	3,809	1,330	...
	Urticaria ... ..				...	8	3	...	11	...	707	268	...
	Eczema				1	50	5	2	56	1	2,058	635	...	
	Herpes ... ..				...	19	2	...	21	1	186	66	...
	Psoriasis ... ..				...	15	2	...	17	2	33	124	...
	Elephantiasis				25	287	13	3	325	15	387	73	...	
	Myiasis				1	1	...	...	2	...	28	5	...
	Chigoes				1	22	3	...	26	1	392	98	...	
	Cutaneous Leishmaniasis ... ..				...	4	...	...	4	...	10	2	...
	Others				26	...	...	...	26	...	...	...	...
X.— <i>Diseases of bones and Organs of Locomotion (other than Tuber- culous).</i>														
156.	Diseases of Bones—													
	Osteitis				19	185	25	7	229	21	694	256	...	
157.	Diseases of Joints—													
	Arthritis				16	222	25	10	263	13	2,261	869	...	
	Synovitis				7	167	14	4	188	5	1,119	251	...	
158.	Other Diseases of Bones or Organs of Locomotion				10	115	20	6	145	10	910	226	...	
Carried forward					1,654	22,305	4,381	1,807	28,339	984	269,728	118,062	383	

TABLE V.—RETURN OF DISEASES AND DEATHS (NON-EUROPEAN)
FOR THE YEAR 1931—*continued*.

Diseases.	IN-PATIENTS.							OUT-PATIENTS.		
	Remaining in Hospital at end of 1930.	TOTAL.			Total cases treated.	Remaining in Hospital at end of 1931.	Male.	Female.	Deaths.	
		Admissions.		Deaths.						
		Male.	Female.							
Brought forward	1,654	22,305	4,381	1,807	28,339	984	269,728	118,062	383	
XI.—Malformations.										
159. Malformations—										
Hydrocephalus ... ..	...	36	12	10	48	13	58	14	...
Hypospadias ... ..	...	...	...	...	...	...	5	...	...
Spina Bifida, etc. ... ..	...	7	2	...	9	...	72	22	...
XII.—Diseases of Infancy.										
160. Congenital Debility	1	19	18	10	38	..	117	67	8	
161. Premature Birth	1	19	16	6	36	...	13	10	...	
162. Other affections of infancy	5	40	17	13	62	3	249	290	2	
163. Infant neglect (infants of three months or over)	3	10	7	2	20	1	58	33	1	
XIII.—Affections of Old Age.										
164. Senility— ... ..	...	32	7	14	39	2	50	43	2
Senile Dementia ... ..	...	17	3	9	20	1	8	5	...
XIV.—Affections produced by External Causes.										
165. Suicide by Poisoning ... ..	...	1	...	1	1	...	...	...	...
166. Corrosive Poisoning (Intentional) ... ..	...	1	...	...	1	...	...	...	...
167. Suicide by Gas Poisoning ... ..	...	...	...	...	...	...	...	...	...
168. Suicide by Hanging or Strangula- tion ... ..	...	...	...	...	...	...	...	...	...
169. Suicide by Drowning ... ..	...	...	...	...	...	...	...	...	...
170. Suicide by Firearms ... ..	...	...	...	...	...	...	1	...	1
171. Suicide by cutting or stabbing In- struments ... ..	...	6	1	7	7	...	2	...	2
172. Suicide by jumping from a height ... ..	...	...	...	...	...	...	...	...	...
173. Suicide by crushing ... ..	...	...	...	...	...	...	...	...	...
174. Other Suicides ... ..	...	1	...	1	1	...	1	...	1
175. Food Poisoning— ... ..	...	6	1	2	7	...	4	1	...
Botulism ... ..	...	1	1	...	2	...	1	2	...
176. Attacks of poisonous animals ... ..	...	...	...	...	...	...	...	...	...
Snake Bite	2	49	11	4	62	1	164	35	...	
Insect Bite ... ..	...	8	...	...	8	...	269	77	...
177. Other accidental Poisonings	1	16	15	11	32	1	29	7	...	
178. Burns (by Fire)	12	126	36	25	174	7	1,210	452	1	
179. Burns (other than by Fire)	3	35	14	3	52	4	306	135	...	
180. Suffocation (accidental) ... ..	...	...	...	...	...	...	...	...	...
181. Poisoning by Gas (accidental) ... ..	...	1	...	...	1	...	2	...	...
182. Drowning (accidental) ... ..	...	1	...	1	1	...	1	...	..
183. Wounds (by Firearms, war excepted)	3	124	8	12	135	10	40	9	1	
184. Wounds (by cutting or stabbing instruments)	11	731	93	35	835	33	9,407	1,269	1	
185. Wounds (by Fall)	48	145	27	4	220	9	3,979	869	...	
186. Wounds (in Mines or Quarries)	5	84	...	8	89	1	1,095	3	...	
187. Wounds (by Machinery)	2	38	4	1	44	...	530	14	...	
Carried forward	1,751	23,859	4,674	1,986	30,283	1,070	287,399	121,419	403	

TABLE V.—RETURN OF DISEASES AND DEATHS (NON-EUROPEAN)
FOR THE YEAR 1931—*continued*.

Diseases.	IN-PATIENTS.							OUT-PATIENTS.		
	Remaining in Hospital at end of 1930.	TOTAL.			Total cases treated.	Remaining in Hospital at end of 1931.	Male.	Female.	Deaths.	
		Admissions.		Deaths.						
		Male.	Female.							
Brought forward	1,751	23,859	4,674	1,986	30,283	1,070	287,399	121,419	403	
XIV.—Affections produced by External Causes—contd.										
188. Wounds (crushing, e.g. railway accidents, etc.) ... ..	...	79	14	14	93	2	321	43	...
189. Injuries inflicted by Animals, Bites, Kicks, etc.	2	59	15	...	76	4	754	277	...	
190. Wounds inflicted on Active Service	3	...	...	...	3	...	...	...	...
191. Executions of civilians by belligerents ... ..	...	...	...	...	...	...	...	...	...
192. A.—Over fatigue ... ..	...	3	...	1	3	...	2	1	...
B.—Hunger or Thirst ... ..	...	23	5	6	28	...	4	2	...
193. Exposure to Cold, Frost bite, etc. ... ..	...	2	...	1	2	...	...	...	...
194. Exposure to Heat—										
Heatstroke ... ..	...	2	...	1	2	...	1	...	...
Sunstroke ... ..	...	1	...	1	1	...	2	...	...
195. Lightning Stroke ... ..	...	1	...	...	1	...	1	...	...
196. Electric Shock ... ..	...	4	...	2	4	...	4	...	...
197. Murder by Firearms ... ..	...	...	...	...	...	...	...	...	...
198. Murder by cutting or stabbing instruments	1	...	...	...	1	...	...	...	...
199. Murder by other means ... ..	...	...	...	...	...	...	...	...	...
200. Infanticide (Murder of an infant under one year) ... ..	...	...	...	...	...	...	...	...	...
201. A.—Dislocation	1	41	16	1	58	3	108	30	...	
B.—Sprain ... ..	...	97	12	...	109	3	2,029	224	...
C.—Fracture	27	498	68	53	593	55	372	95	4	
202. Other External Injuries	36	838	119	13	993	30	20,380	2,693	1	
203. Deaths by Violence of unknown cause ... ..	...	6	...	6	6	...	...	...	...
XV.—Ill-Defined Diseases.										
204. Sudden Death (cause unknown) ... ..	...	11	...	11	11	...	1	1	2
205. A.—Diseases not already specified or ill-defined—										
Ascites	8	117	19	32	144	6	113	33	...	
Œdema	3	40	4	11	47	1	108	32	...	
Asthenia	7	86	24	22	117	9	806	414	1	
Shock ... ..	...	8	4	2	12	1	15	1	...
Hyperpyrexia ... ..	...	17	...	...	17	...	47	10	...
B.—Malingering ... ..	...	37	3	...	40	...	296	11	...
XVI.—Diseases, the total of which have not caused 10 Deaths ...										
Ulcers	232	2,348	513	38	3,093	247	30,786	12,924	...	
Total	2,071	28,177	5,490	2,201	35,738	1,431	343,549	138,210	411	

APPENDICES.

APPENDIX A.

REPORT OF THE LABORATORY SERVICE.



MEDICAL LABORATORY SERVICE.

The Deputy Director, Dr. A. Connal, retired on pension during the year and the laboratory service thus lost also the services of Dr. S. L. M. Connal, entomologist. Towards the end of the year Dr. H. Morrison, senior pathologist and Dr. R. M. Burnie, research medical officer, also retired.

The general work of the Medical Research Institute is described by Dr. E. C. Smith, who also describes, with Dr. B. G. T. Elmes, the work carried out upon the preparation of anti-variola neuro-vaccine. Dr. J. A. Young describes work upon the bacillary dysentery group of organisms.

The reports upon the clinical laboratories at Lagos, Port Harcourt and Kaduna, prepared by Drs. Morrison, McCoach and Burnie, are summarised.

The work carried out by the dietetics pathologist, Dr. McCulloch, at the Katsina laboratory, and in association with the Animal Health Committee, is mentioned in the general medical report. Owing to absence upon leave for a considerable period of the year no special report is being submitted for 1931.

A report upon relapsing fever was submitted by Dr. Burnie to the Medical Research Council before his retirement.

MEDICAL RESEARCH INSTITUTE.

Tumours.—Fifty-three specimens of tumour were received at the Medical Research Institute for examination. Of these 16 were benign and 37 malignant. The malignant neoplasms comprised 17 carcinomata and 20 sarcomata.

The carcinomata included :—

- Four primary carcinomata of the liver.
- A mixed-cell carcinoma of parotid gland.
- Two squamous carcinomata of the scalp.
- A glandular carcinoma of the female breast.
- A glandular carcinoma of the kidney.
- A squamous carcinoma of the orbit.
- A squamous carcinoma involving tibia.
- A glandular carcinoma involving humerus.

The sarcomata included :—

- Two round-cell sarcomatata of the orbit.
- Five melanotic sarcomata, sole of foot.
- One melanotic sarcoma, dorsum of foot.
- One sarcoma of the foot—Kaposi type.
- Two lymphosarcomata.
- Two angio-endotheliomata, one of neck and one sole of foot.
- A round cell-sarcoma involving tibia.

Of the other specimens received for examination, two were ulcers of the groin infected with Ducrey's bacillus and two were mycetoma, one of the foot and one of the elbow, both were the red-grain type (*Nocardia indica*).

Paragonimus ova in sputum.—A specimen of sputum containing ova identical with those of *Paragonimus* was received from Dr. Libert, Bamenda. A sample was sent to Professor Leiper for confirmation.

Hodgkin's disease.—This condition seems to be of relatively frequent occurrence. Four specimens were received, all histologically typical. From the glands of two, cultures were made by the Krumwiede

method on serum agar. Diphtheroids were obtained in pure culture in one instance, and contaminated with staphylococci in the other. Inoculation experiments are being made in *Macacus rhesus* monkeys.

Rabies.—During the year 23 brains were received for examination, one being from a cat (positive). The remainder being all from dogs of which eleven were positive for negri bodies. Their place of origin is as follows:—

Port Harcourt, three; Bamenda and Buea, two each; Victoria, Warri, Ilorin, Zaria and Akure, one each.

Tropical ulcer.—Work on this subject is being continued and the results obtained have been described in the published articles noted.

PAPERS PUBLISHED.

1. Cultivation of the spirochætes associated with tropical ulcer.
Proc. Roy. Soc. Med. (Sect. Trop. Dis.) XXIV. 1.
2. Hormodendrum Dermatitis.
Trans. Roy. Soc. Trop. Med. January.
3. Bacteriology of Tropical Ulcer.
West African Medical Journal. January.
4. Experimental Tropical Ulcer.
West African Medical Journal.
(with Dr. Elmes). April.

ANTI-VARIOLA VACCINE.

NEURO-TESTICULAR STRAIN.

The rabbit neuro-vaccine having failed to maintain its potency for human skin, it was decided to try the effect on the virus of testicular passage in the same animal.

Cultivation of the vaccine.—The strain was cultivated by continuous testicular passage in rabbits. The animal is inoculated in each testis with 1 cc of an emulsion of the virus.

The maximum development of the reaction is attained on the fourth or fifth day, and the organs are then removed aseptically after killing the animal with chloroform. The testes are stored in the ice drawer of a frigidaire. A general post-mortem examination is made in every case.

Contamination of the vaccine.—*Pseudomonas pyocyanea* was present in cultures from the testes in the first four passages. It was fortunately found possible to eliminate the organisms by freezing and drying the testis. In connection with this procedure we are indebted to the Rockefeller Yellow Fever Commission for their help and the use of apparatus.

With strict aseptic precautions at the time of inoculation, and removal of the organs it should be possible to avoid contamination. No further infection has occurred up to the present (tenth passage).

PREPARATION OF THE VACCINE.

Glycerinated vaccine.—The testis is cut into small portions and ground up in a pestle and mortar, with a little sterile 50 per cent glycerine (pH 7.6).

The mixture is then passed through the lymph mixing machine three times with gradual addition of more 50 per cent glycerine until a final dilution of 1-20 results. On standing there is a considerable deposit and this occurs even in capillary tubes.

To obviate this difficulty it was decided to centrifuge the diluted vaccine and use the supernatant fluid. Both the supernatant fluid and the deposit were found to be of high potency when tested on the human skin.

The vaccine is tested for sterility before and after preparation.

Lanolinated vaccine.—A mixture of 1 grm. of dried testicular vaccine and 2 grms. of anhydrous lanoline was prepared and tested by primary vaccination of human subjects. The results were not reliable and further experiments will be carried out after obtaining a supply of pure lanoline.

Experimental Vaccination of Human Beings.—Primary vaccinations were again carried out in school children at Ebute Metta by the courtesy of the medical officer of health, the education authorities and the school managements.

The method of vaccination was the same as that previously employed (*see* annual report, 1930).

The following series of experiments were performed :—

A.—Glycerinated vaccine, dilution 1-20, using the supernatant fluid after centrifuging.

Vaccine stored at 10°C in frigidaire.

No. of cases.	No. positive.	Case success rate.	Insertion success rate.
88	86	97.1 %	97.3 %

B.—Comparative test with the above vaccine and lanolinated lymph (Lister Institute) obtained from the health office, Lagos :—

Vaccine.	No. of cases.	No. positive	Case success rate.	Insertion success rate.
Neuro-testicular	25	25	100 %	96.0 %
Lanolinated lymph	... 25	22	88 %	100 %

C.—Effect of storage at room temperature on potency :—

Vaccine.	No. of days at room temperature.		No. of cases.	No. positive.
Glycerinated neuro-testicular 1-20	...	3	3	3
„ „ „ „ „	...	5	6	3
„ „ „ „ „	...	6	6	5
„ „ „ „ „	...	7	3	2
„ „ „ „ „	...	8	3	0
„ „ „ „ „	...	10	3	0
„ „ „ „ „	...	14	4	0
„ „ „ „ „	...	18	4	0
Diluted with sheep serum 1-20	...	5	3	2
„ „ „ „ „	...	6	3	1
„ „ „ „ „	...	7	3	0

Remarks.—From the above tables it will be seen that a high case success rate (97.1 per cent.) was obtained with the glycerinated vaccine when stored at 10°C, but that rapid loss of potency occurs at room temperature. It is doubtful if this vaccine is sufficiently stable for issue except to stations where cold storage is available.

A duration of potency of four days at room temperature is undesirably small for an anti-variola vaccine. There was considerable loss of activity when the virus was frozen and dried so that desiccation cannot be looked to to overcome the difficulty.

The loss of potency may be due to some degree to the glycerine, and it will be advisable to test other diluents such as pure lanoline, albumen water, Ringer and normal saline solutions.

The Lesion.—The development of the vaccine on the human skin conforms in type to that produced by calf lymph though the reaction develops rather earlier.

Post-vaccinal complications.—As far as is known, no case of post-vaccinal encephalitis followed the use of neuro-testicular vaccine.

Potency test on animals.—The testicular strain when inoculated into a rabbit's cornea in a dilution of one in 500 in sterile water gave rise to a typical opacity in 72 hours, the control eye remaining negative. A dilution of 1-1,000 failed to give a reaction.

Rabbits for Vaccine Production.—It has been estimated that 1,000 doses of vaccine could be obtained from each rabbit using a dilution of 1-20 in 50 per cent glycerine. To supply the whole of Nigeria approximately 700 male rabbits would be required each year. Inquiries made in England reveal that it is unlikely that such a number could be obtained.

Successful local breeding is therefore essential if the vaccine is to be produced in large quantity.

There has been some improvement in breeding at Yaba since the introduction of a lettuce diet. A garden for the cultivation of such green food has been established.

Free access of air, *i.e.*, no mosquito proofing, and strict cleanliness of the animal houses has lessened death from disease.

It has been found difficult to prevent the occurrence and spread of disease if the animals are allowed to burrow in the ground in open pens. Tuberculosis was rife in one batch kept under these conditions and all the animals had to be destroyed.

Calf vaccination.—Only one calf of the local breed of small cattle could be obtained for experimental purposes. It failed to react to skin inoculation with both the neuro-testicular vaccine and the lanolinized lymph of the Lister Institute.

Sheep vaccination.—These animals are to be tested as vaccinifers.

Buildings.—The alterations to the old analytical chemist's laboratory and the erection of new buildings were not completed at the end of the year. It is hoped to obtain possession in March.

Publication.—“Results of Experimental Work with Neuro-vaccine in Lagos”. West African Medical Journal, July, 1931.

The study of bacillary dysentery has been continued throughout the year. As in previous years, a diversity of types has been found among the strains isolated. Of 22 Flexner strains, four were type V, two were V Z, eleven were W, two were Z and two conformed to the serological reactions of the Lagos type described in 1929.

Two cases of Schmitz dysentery were found, the strains giving the typical cultural reactions and agglutinating to full titre with a Schmitz serum.

No case of Shiga dysentery was seen.

The presence of bacteriophage in the faeces of dysentery patients has been demonstrated in a number of cases but a more important finding was a negative one in a case studied under optional conditions. The patient was one of the native staff of the institute and the organism,

one of the Z strains mentioned above, was isolated on the first day. The patient was completely recovered by the fifth day. The fæces was tested daily and no phage was evident for any of the Flexner strains. Samples of sera taken on the first, third and tenth days were tested simultaneously against all the Flexner types. The result were as under :—

	1st day.	3rd day.	10th day.
V	$\frac{1}{10}$	$\frac{1}{15}$	$\frac{1}{120}$
W	—	—	$\frac{1}{20}$
X	$\frac{1}{15}$	$\frac{1}{15}$	$\frac{1}{15}$
Y	—	—	—
Lagos type	$\frac{1}{20}$	$\frac{1}{20}$	$\frac{1}{40}$
Patient's organism	—	—	$\frac{1}{240}$

In spite of these results which suggested that the organism was a V, the organism when tested with type sera proved to be a Z agglutinating to 100 per cent. titre with a Z serum and only to 1.6 per cent. with a V serum. The results bear out other findings in the serology of the Flexner strains made throughout the year which suggest that there is an antigen present in large quantities in the recently isolated bacterium which is lacking or reduced in the classical laboratory types.

The study of this antigen has been facilitated by the discovery that certain strains of the late lactose fermenting coliform group while agglutinating with Flexner sera only in titres within the range for natural agglutinin formation and producing sera capable of agglutinating the Flexner types in titres of over $\frac{1}{1000}$.

The agglutinogenic response to even a small inoculum is remarkably rapid and there appear to be grounds for believing that the agglutinins artificially induced are allied to " natural " agglutinins.

The problem is one having an important bearing on the immunity of bacillary dysentery.

During the year a number of sera were tested for agglutinins for the enteric group.

Of 150 sera collected for purposes other than routine tests for enteric, 50 were from children under 10 years, 50 were from patients in Yaba Asylum, and 50 were from sera sent to the Lagos Laboratory for the Kahn test.

The results were as under :—

Children	$\frac{1}{12\frac{1}{2}}$	$\frac{1}{25}$	$\frac{1}{50}$	$\frac{1}{100}$	and over	Neg.	$\frac{1}{12\frac{1}{2}}$
T ...	10	—	5	5			30
A ...	3	1	—	—			46
B ...	6	9	2	4			29
<hr/>							
Lunatics.							
T ...	5	3	1	—			41
A ...	1	—	1	—			48
B ...	2	7	3	5			33
<hr/>							
Adults.							
T ...	10	1	6	4			29
A ...	3	2	1	—			44
B ...	4	8	1	4			33

These results are relatively high for a race in which enteric is rare clinically.

These results are independent of widals done as a routine for the Health Department.

An instance of the value of the widal test as a means of detecting carriers was afforded when, following the death from typhoid of a boy from an industrial home, the bloods of the remaining 47 boys were tested. One boy showed a titre of $\frac{1}{100}$ for B typhosus. The organism was isolated from the urine.

CLINICAL LABORATORIES.

TABLE I.

BLOOD EXAMINATION IN EUROPEANS.

					Lagos.	Port Harcourt.	Kaduna.
Total Examinations	...	...	...	...	455	138	276
Subtertian parasites	...	..	...	...	36	5	40
Percentage positive	...	...	...	...	7.8	3.6	12.5
Microfilariae	...	...	...	...	...	5	3

TABLE II.

BLOOD EXAMINATION IN AFRICAN.

					Lagos.	Port Harcourt.	Kaduna.
Total Examinations	...	...	...	...	6,332	2,364	2,012
Subtertian parasites	...	...	...	...	1,505	113	311
Percentage positive	...	...	...	...	23.8	4.8	15.5
Microfilariae	...	...	...	...	98	29	6
T. gambiense	...	...	...	...	1	1	2
S. recurrentis	...	..	...	...	...	...	1
Quartan parasites	...	...	...	...	30	...	...
Benign Tertian parasites	...	...	...	...	...	...	...

Blood examinations at Lagos and Port Harcourt include a large number of thick films examined in connection with the medical examination of school children. Crescents were noted upon 12 occasions at Lagos and upon six occasions at Kaduna.

TABLE III.

EXAMINATION OF FÆCES—EUROPEAN.

					Lagos.	Port Harcourt.	Kaduna.
Total Examinations	...	...	...	...	226	66	165
E. histolytica	...	...	...	...	14	...	10
E. coli	...	...	...	...	15	...	...
Ascaris ova	...	...	...	...	4	2	...
Ancylostome ova	...	...	...	..	...	2	1
Trichiuris ova	...	...	...	...	1	3	1
Schistosome ova	..	...	...	...	...	...	7

TABLE IV.
EXAMINATION OF FÆCES—AFRICAN.

						Lagos.	Port Harcourt.	Kaduna.
Total Examinations	...	...	...	...	...	3,912	1,015	2,091
<i>E. histolytica</i>	...	...	...	...	...	68	33	189
<i>E. coli</i>	...	...	...	...	...	656	13	64
<i>Ascaris ova</i>	...	...	...	...	...	2,345	365	111
<i>Ancylostome ova</i>	...	...	...	...	...	1,749	467	312
<i>Trichiuris ova</i>	...	...	...	...	...	2,468	326	44
<i>Schistosome ova</i>	...	...	...	...	...	10	...	12
<i>Strongyloides</i>	...	...	...	...	...	134	47	4
<i>Tænia saginata ova</i>	..	...	...	...	...	25	4	80

E. histolytica was found in free form in 135 cases and in encysted form in 155 cases.

TABLE V.
SPUTUM EXAMINATION—AFRICAN.

						Lagos.	Port Harcourt.	Kaduna.
Total Examinations	...	...	...	...	...	371	149	215
Tubercle bacilli	...	...	...	...	...	82	21	16

Fifty-four examinations were also made upon European cases with a positive finding of tubercle bacilli in eight cases. Spironemata were noted in three European and five African cases at Kaduna.

TABLE VI.
URINE EXAMINATION—AFRICAN.

						Lagos.	Port Harcourt.	Kaduna.
Total Examinations	...	...	...	...	...	3,091	769	1,888
Albumen	...	...	...	...	...	1,247	239	29
Casts	...	...	...	...	...	43	36	19
Bile	...	...	...	...	...	88	6	18
Sugar	...	...	...	...	...	15	12	14
Blood	...	...	...	...	...	196	35	61
Pus	...	...	...	...	...	809	208	313
Schistosome ova	...	...	...	...	...	29	7	64

TABLE VII.
KAHN AND SACHS-GEORGI REACTIONS.

						Lagos.	Port Harcourt.	Kaduna.
<i>European.</i>								
Number of tests	...	...	...	...	...	91	24	29
Positive	...	...	...	...	...	26	7	3
<i>African.</i>								
Number of tests	...	...	...	...	...	980	420	818
Positive	...	...	...	...	...	477	260	400

At Port Harcourt 59 Sachs-Georgi tests were made upon cases of yaws undergoing treatment with bismuth. Of these 46 were positive.

Agglutination tests.—Three widal tests were made upon Europeans at Lagos, one being positive, and 57 with three positive results in Africans. At Kaduna seven European cases were tested with positive results in four and ten African cases all of which were negative.

Tumours.—The following tumours, etc., were sectioned :—

Lagos.	Port Harcourt.	Kaduna.
Rodentulcer 2	Epithelioma 1	Epithelioma 1
Epithelioma :—	Carcinoma of breast ... 1	Carcinoma 3
Scalp 2	Secondary carcinoma ... 1	Sarcoma 2
Vulva 2	Sarcoma 1	Endothelioma 1
Ear 1	Melanotic sarcoma ... 2	Lipoma 2
Leg 1	Fibro-sarcoma 2	Colloid goitre 1
Scrotum 1	Cystic ovary 1	
Carcinoma of :—	Fibromata 2	
Antrum 1	Gummata 2	
Breast 2	Gynomastia 1	
Liver 3	Polyp of rectum 1	
Prostate 1	Uterine fibroid 1	
Round-celled carcinoma of		
nasal mucosa 1		
Primary glandular carcinoma of axilla 1		
Mixed-celled sarcoma ... 2		
Round-celled sarcoma ... 3		
Melanotic sarcoma of heel 1		
Endothelioma of parotid 1		
Endothelioma of omentum 1		
Fibro-sarcoma 2		
Fibro-myxoma 1		
Fibroma 8		
Myxoma 1		
Fibrocystic disease (maxilla) 1		
Osteo-fibroma 1		
Papilloma 1		
Polypus 1		
Onchocercus volvulus (scalp) 1		

POST-MORTEM EXAMINATIONS .

In view of the prejudice against post-mortem examinations few are made except under a Coroner's order. The following table gives the findings :—

TABLE VIII.
POST-MORTEM EXAMINATION—AFRICAN.

	Lagos.	Port Harcourt.	Kaduna.
Injuries	32	7	2
Burns	6	0	0
Poisoning	10	0	0
Drowning	16	5	0
Respiratory diseases (excluding tubercle) ...	25	7	8
Tuberculosis (various forms)	21	4	2
Circulatory System diseases	20	2	3
Nephritis	11	0	2
Abdominal diseases (excluding dysentery) ...	10	4	2
Central Nervous System diseases	8	1	3
Dysentery and Diarrhoea	6	0	1
Sepsis	4	2	0
Marasmus, Senility, etc.	4	0	0
Genito-urinary (excluding nephritis)	2	0	0
Malignant disease	1	0	1
Unknown and various	7	6	2

APPENDIX B.

REPORT OF THE TSETSE INVESTIGATION

BY

H. M. O. LESTER, M.R.C.S., L.R.C.P.

Deputy Director, Tsetse Investigation.

TSETSE INVESTIGATION.

Throughout the year the tsetse investigation has carried out laboratory research work at Gadau together with the treatment of sleeping sickness in the field. For six months the work at Gadau had to be carried out by a skeleton staff owing to the absence on leave of most of the research workers.

There has been some reduction of staff; Mr. J. Kirkham, European electrician, left the investigation in March, his work being carried on by African artisans. Captain A. S. Thornewill, assistant conservator of forests, resumed his substantive duties with the Forestry Department in October, and Dr. F. Kane relinquished his appointment as biochemist on his resignation from the West African Medical Service in December.

During the year the following scientific papers have been published "Some observations on anti-complementary sera," by Dr. R. D. Mackenzie and R. S. Marshall, "The specificity of the Kahn Test in Trypanosomiasis" and "Observations on the Reaction Rate in the Formol-Gel Reaction" by C. W. Hope-Gill. Two papers, "Pupal Parasitism of *G. morsitans* (form *submorsitans*) and *G. tachinoides* at Gadau, Northern Nigeria" and "An enquiry into the origin of an outbreak of schistosomiasis among Europeans at Kagoro, Northern Nigeria," by A. W. Taylor, have been submitted for publication. Papers dealing with (1) the susceptibility to trypanosomiasis of clean cattle and those that have been kept in infected areas, and with (2) the effect of cyclical transmission by tsetse on a strain of *T. brucei* made resistant to human serum, are being prepared.

A meeting of the Committee of Animal Health was held at Gadau in January. At this meeting it was decided to publish the committee's work on pica in cattle and at the same time a new programme of work arising from these findings was agreed upon. The tsetse investigation is to undertake experiments to determine the effect of feeding various minerals, on the course of trypanosomiasis in cattle. A start is being made with these experiments which should be completed next year.

LABORATORY WORK.

CATTLE EXPERIMENTS.

(1) *Susceptibility to Trypanosomiasis*.—It has been suggested that cattle entering a fly area for the first time are much more susceptible to trypanosomiasis than the local cattle which may have been exposed periodically to infection all their lives. An experiment carried out to test this hypothesis showed that there was no difference with *T. congolense* and *T. vivax*, between a group of clean animals bred on the Stock Farm Vom and a group of local animals. These clean animals were supplied through the courtesy of the chief veterinary officer.

(2) *Premunition*.—The results of experiments devised to investigate the nature of the premunition which may result after infected animals have been treated with tartar emetic, showed that the whole question of the treatment of Nigerian cattle with tartar emetic required re-investigation. The method of treatment used was the standard method at present in vogue in this country, and our experience was that, a number of cattle were killed off by the treatment and that, many of the others which survived the treatment died a month or two later, trypanosomes still being present in their blood.

Feeding Experiments.—Two experiments were arranged to test the effect of the absence of (1) vitamins A and D and (2) vitamin B, on the susceptibility and resistance of rats to trypanosomiasis. The first of these experiments was unsuccessful as the rats on the deficient diet did not show the classical signs of vitamin A deficiency. The second experiment showed that while the susceptibility of rats to a strain of *T. gambiense* of low virulence was not increased by a deficiency of vitamin B, the resistance of the animals was lowered by the concurrent deficiency disease.

AN INVESTIGATION INTO THE NATURE OF SOME TRYPANOSOME STRAINS ISOLATED FROM SLEEPING SICKNESS PATIENTS.

The work on the characteristics of local strains Nos. 1-5 has been continued and their behaviour has been compared with that of other strains, two of which have been recently isolated from cases in Ayu district of Jemaa division, another from this locality, the fourth being an old laboratory strain which had been kept going for some years in small animals in London.

Particular attention is being paid to the following characters :

- (1) Virulence in small animals, (2) The reaction to tryparsamide, (3) The reaction to human serum.

(1) *Virulence in laboratory animals.*—Strain Ayu 6, the local strain No. 6 and the old London strain are all very virulent to laboratory animals; they kill a guinea pig in about a week and a white rat in an even shorter time. Strain Ayu 5 is comparatively avirulent being very similar in this respect to the Gadau strains 1-5.

(2) *The reaction to tryparsamide.*—Strain Ayu 6 is completely resistant to tryparsamide, while two others Gadau 1 and 6 have a considerable degree of resistance to this drug. It seems to us to be very significant that three out of ten strains tested show a natural resistance to tryparsamide in small laboratory animals. The strain Gadau 4 which was originally very sensitive to tryparsamide was made arsenic fast by giving repeated small doses. It was not possible to discover whether this acquired characteristic could be transmitted through the fly as all attempts at transmission failed probably because the strain had become practically non-transmissible during the necessary manipulation. On the other hand, strain Ayu 6 was found to be tryparsamide resistant after passage through *G. morsitans*, though in this case it is probable that the arsenic resistance is a natural as opposed to an acquired characteristic.

(3) *The reaction to human serum.*—In vitro experiments have been carried out with all these strains. Whereas Gadau strains Nos. 1-5 and Ayu 5 are all completely insensitive to human serum, strains Ayu 6, Gadau 6 and the London strain are killed in under three hours, the three brucei strains tested being killed within six hours.

It appears that two strains Ayu 6 and Gadau 6 have many of the characteristics usually ascribed to *T. rhodesiense*, while Gadau 2, 4, 5, and Ayu 5 resemble the classical *T. gambiense*. Three strains Gadau 1, 3 and Ayu 5 have intermediate characteristics.

THE BI-COLOURED GUAIAC TEST IN SLEEPING SICKNESS.

Cerebro-spinal fluids from sleeping sickness patients were examined by this test and the findings controlled by a white cell count. The readings obtained by the bi-coloured guaiac test were interesting in that the curves were of the flat or plateau type very similar to that found in general paralysis. Although this test seemed less sensitive and less informative than the ordinary cell count, it can be recommended to workers in the tropics who want an easily prepared colloidal test for the cerebro-spinal fluid.

TRANSMISSIBILITY OF *T. GAMBIENSE* STRAINS.

Work on the transmissibility of *T. gambiense* strains by *G. tachinoides* has been continued. A total of 20 strains has been dealt with; these strains originated from sleeping sickness areas in Hadejia, Katagum, Ayu, Ganawuri. Duke's findings in East Africa, where a considerable proportion of naturally occurring *T. gambiense* strains was found to be non-transmissible by tsetse (*G. palpalis*) have not been confirmed for these Nigerian strains. When reasonably large numbers of flies were employed all the strains examined proved to be cyclically transmissible by tsetse.

The effect of various factors particularly the climatic factor on the gambiense infection rate in *G. tachinoides* has been tested. It has been shown that the temperature at which tsetse are kept during the infecting feeds plays an important part in determining the infection rate.

BIONOMICS OF *ÆDES ÆGYPTI* IN THE NORTHERN PROVINCES.

In addition to tsetse work the entomologist has been able to carry out a number of other investigations. Work on the bionomics and distribution of *Ædes Ægypti* has been carried out in collaboration with the Rockefeller Yellow Fever Commission of Yaba.

CALCIUM CONTENT OF BLOOD IN SLEEPING SICKNESS.

It was reported last year that while in the early part of the year there was a well marked deficiency in the calcium content of the blood of sleeping sickness patients, the percentage of calcium rose almost to normal at the end of the rains. More recent work has shown that this rise in the amount of blood calcium coincides with the increase in food supply at the time of harvest and it has been concluded that this better food gives patients an opportunity of replacing the loss of calcium consequent on the slight acidosis produced by the disease.

THE BICARBONATE RESERVE IN TRYPANOSOMIASIS.

Estimations of the bicarbonate reserve of cattle infected with *T. congolense* were made throughout the course of the disease. There was a rough inverse proportion between the number of trypanosomes in the blood and the bicarbonate reserve, but there was very little correlation between the bicarbonate reserve and the clinical condition. The terminal collapse of the diseased animal did not appear to be associated with a dramatic alteration in the bicarbonate figure.

CHOLESTEROL CONTENT OF BLOOD IN SLEEPING SICKNESS.

The cholesterol content of the blood both of sleeping sickness patients and of apparently healthy natives was found to be subnormal. These estimations as far as they have been carried do not seem to indicate that there is any direct relationship between the low cholesterol content and the incidence and course of sleeping sickness.

SOIL ANALYSES.

An exhaustive series of analyses of the soil of this district has been completed. Samples of soil were taken from different places and at different depths and the contents in iron, alumina, magnesia, sodium and potassium, calcium, chlorides and phosphates determined. These analyses show the amazing poverty of the soil in soluble salts.

FIELD WORK.

Clearings.—A limited amount of slashing back of regrowth in the Sherifuri and Matyoro areas was carried out during the first part

of the year under the supervision of the forestry officer. No further clearing experiments are to be undertaken and the onus of protective clearings must rest with the Native Administrations, the tsetse investigation only acting in an advisory capacity.

Trapping.—Much has been heard of late concerning the success of the “Harris” tsetse trap in dealing with *G. pallilipes* in Zululand. Although it is very doubtful whether the use on a large scale of any kind of trap is a practicable proposition in this country, attempts have been made to devise traps on a similar principle for *G. tachinoides* and *G. morsitans*. Results so far obtained have not been encouraging.

Sleeping Sickness.—During the year the tsetse investigation has treated some 5,000 cases of sleeping sickness, and practically all these have had a full course of 20-30 grammes of trypanamide. It should be mentioned that the number of cases treated has depended largely upon the staff available and bears little relation to the real amount of sleeping sickness in the country.

Although we have been able to carry out the system of mass examination and treatment in parts of Plateau Province and of Hadejia and Katagum Emirates, we have only had eight trained African dispensary attendants and 16 dispensary attendants-in-training for this task. These African dispensary attendants are doing very good work, they have become expert microscopists, and can be trusted to carry out treatment under the supervision of European medical officers.

Work done has shown that the position with regard to sleeping sickness is very much more serious than we had previously imagined. Large parts of Southern Zaria are known to be infected, we believe that there are thousands of cases in that part of the country and the infected area extends well down into Niger Province. To the north of us there is a serious epidemic involving the Galadima and Gamawa districts of Katagum Emirate, the Serikin Dawaki, Chiroma, and parts of Auyo and Wambai districts of Hadejia Emirate and the Bedde Emirate. The position here is very serious as this epidemic appears to be of a recent origin, is spreading rapidly and is of a very virulent type, killing off patients in under one year.

It is hoped that next year we shall have a considerable increase in the number of dispensary attendants so as to have more chance of dealing adequately with these extensive epidemics.

Dr. J. C. Paisley, senior sleeping sickness officer, reports on the work of the sleeping sickness staff. A report by Dr. C. W. Hope-Gill on the treatment of sleeping sickness in Jemaa division, Plateau Province is included, as this gives an indication of the type of work which can be done by a sleeping sickness team under the new system of mass examination. The mass examination of Jemaa division was the first effort of its kind to be carried out in Nigeria and it should be realised that Dr. Hope-Gill has had at his disposal only a limited staff for this work.

THE WORK OF THE SLEEPING SICKNESS STAFF.

The year has shown a marked increase in the amount of sleeping sickness work carried out. This has been due partly to the extension of the system of mass survey and treatment, and partly to the discovery of new epidemics of the disease in the Katagum, Hadejia and Bedde Emirates. The centres where the work has been carried out will be dealt with separately.

At Gadau, 916 cases have been treated, chiefly from the Hadejia and Katagum areas. Every effort has been made to persuade the patients to remain in camp until they have had a full course of 30 grammes of trypanamide, in this connection the District Officers, Hadejia and Katagum have been very helpful. Treatment, as before

is controlled, and results observed by examination of the cerebro-spinal fluid, except in the case of very young children. Though a course of 30 grammes of tryparsamide may not cause a complete return to normal of the fluid, there is some evidence that the improvement is progressive long after the termination of the course. It is difficult to clear up this point, as patients object to repeated lumbar puncture.

In Hadejia Emirate, the districts of Serikin Auyo and Wambai have been surveyed. The results are shown below :—

District.	Official population.	Population counted.	Population examined.	Attendance rate.	S.S. cases.	Infection rate in those examined.
Serikin Auyo ...	22,419	15,898	15,820	% 99	749	% 4·7
Wambai ...	20,394	12,047	11,745	97·4	263	2·2

The large difference between the official population and the population counted is due to the people's habit of leaving their villages in the extreme dry season to work in the towns, but more to the fact that they were antagonistic to the survey, and refused to be counted or examined. The results of this are now apparent—many new cases per month come to Gadau for treatment from this area, having realised their mistake and seen the improvement in their friends who have been treated by the survey team. Out of the 1,021 cases (nine from other areas) diagnosed by the team in these two districts 941 have had a full course, 43 refused treatment and ran away and 37 died. Disturbance of vision due to treatment was observed in 12 cases.

It was found that while in the western and south western parts of these districts the infection rate did not exceed two per cent in the eastern parts the average infection rate was 22 per cent. This heavily infected area probably extends to all the country lying between and bordering the Hadejia and Katagum rivers.

The Galadima and Gamawa districts of Katagum Emirate are at present being surveyed. The figures to date are :—

Population counted.	Population examined.	Attendance rate.	S.S. cases.	Infection rate in those examined.
18,744	18,167	97·1%	2,139	11·7%

In the Plateau Province, the whole of Jemaa division (except Jaba district done last year), has been surveyed with satisfactory results. Ganawuri district, Jos division, was included in this survey, as it borders on Jemaa division and was known to be heavily infected. The results are shown below.

District.	Population counted.	Population examined.	Attendance rate.	S.S. cases.	Infection rate in those examined.
K. K. Y. ...	17,197	16,926	% 98·5	554	% 3·3
Jemaa ...	15,434	15,260	98·9	615	4·0
Ayu ...	3,449	3,444	99·9	172	5·0
Ninzam ...	7,139	7,121	99·7	169	2·3
Kagoro ...	9,929	9,909	99·7	338	4·2
Morowa ...	9,141	9,067	99·2	175	1·9
Ganawuri ...	8,442	8,427	99·8	738	8·7
Total ...	70,731	70,154	99·1	2,761	

The population counted in every case exceeded the official population. The habits of the pagan population of this area favour a mass survey, as they seldom travel from their villages. Of these 2,761 cases, 2,587 completed full courses of treatment 65 for various reasons failed to do so, and 109 died, 82 before and 27 during treatment. Only one patient suffered from disturbance of vision, an interesting contrast with the Hadejia figure.

In the Tudun Wada district, Kano Emirate, owing to shortage of staff and other difficulties, no survey could be attempted. A sleeping sickness medical officer toured the area thoroughly in the first five months of the year, and treated 243 cases. Eight deaths were recorded among these.

In Mama, southern division, Plateau Province, 162 cases were treated in the first four months of the year. Four deaths were recorded. A survey of this division is being carried out but figures are not yet available.

Preliminary surveys have been made in the Kauro-Karko area, Zaria division, and in the Lafia-Awe area, Benue Province. In Zaria out of 2,501 persons examined, 211 cases were found, i.e., an infection rate of 8.4 per cent. It is intended to deal with this area as soon as trained staff is available. In the Lafia-Awe area the infection rate was very much smaller, 2.2 per cent being the highest found.

The total number of cases actually treated by the sleeping sickness staff is 5,104, out of which 175 deaths were reported. Approximately 3,000 cases have been diagnosed in the Katagum survey now in progress and these are not included in the above figure.

REPORT ON THE TREATMENT OF SLEEPING SICKNESS IN JEMAA DIVISION AND GANAWURI DISTRICT, JOS DIVISION.

The examination and treatment of Jemaa division and Ganawuri district, Jos Division, for sleeping sickness has covered a period of nearly 14 months. During this time approximately 82,000 people have been examined out of which 3,029 cases of sleeping sickness were diagnosed. Amongst the latter 110 deaths were reported, 82 before, and 28 during treatment. The number who should have completed full courses of treatment is therefore 2,919. The number who have actually completed full courses is 2,854, leaving 65 who for various reasons failed to do so. A considerable number of the latter fall only a little short of the complete treatment.

The dosage was based on 24 grammes tryparsamide for a full grown adult, divided into eight weekly injections of 3 grammes each. The dosage was reduced in proportion to the approximate size and weight of the patients, small children being given 1 gramme, children between the ages of seven to 15, 2 grammes, while feeble and seriously ill patients had their preliminary doses much reduced.

In endemic areas where the diseases was mild it was the custom to begin with a 3 gramme dose for an adult reducing this only in special cases of serious illness. In an epidemic area, as Ganawuri, the routine was 2 grammes for the first dose, increasing to 3 grammes for the succeeding doses, except in the more seriously ill cases. The total amount of tryparsamide used was approximately 50,000 grammes, the cost of which amounts to £250 on the basis of five shillings per 50 gramme bottle. The cost of salaries of personnel, trekking, and medical stores is probably underestimated at £1,750, making the total cost for the examination and treatment in the region of £2,000.

Since the completion of the examination, treatments have extended from 18th August, 1931, commencing at Ganawuri to 29th October, 1931, where treatments were finally wound up at the last centre where they were inaugurated.

Three treatment teams have been at work, each trekking round three centres of treatment, making nine treatment centres in all. Two teams were centred on Jagindi and Kurmin-goro respectively in Jemaa division were the furthest centres apart and involved a distance of about 70 miles by trek.

In Jaba, Kaje-Kagoma-Yeskwa, Jemaa, Ayu, Ninzam, and Ganawuri districts the patients attended better than was expected, owing to the efficiency of the Native Administrations. Morowa and Kagoro were troublesome during the earlier part of treatments during my absence while I was instituting treatments in other parts of the division. The matter was reported to Mr. E. A. Carr, Assistant District Officer in charge of the division, who took prompt measures to ensure a better attendance, Mr. J. S. Synge, Assistant District Officer, personally supervised treatments at Kagoro and Morowa during the critical period and brought attendances up to a high percentage. The treatment team under the supervision of a 2nd class nurse, continued work in Morowa and Kagoro for another three weeks after the majority had completed their eight weekly treatment in order to enable the former absentees to finish their courses. Work was also continued at Ganawuri for an extra three weeks in order to complete treatments of a certain number of additional patients who complained of sleepiness and begged for injection during the early part of the work. In Ganawuri district 739 patients completed full course of tryparsamide treatment.

During periodical inspection of the patients special attention was paid to the condition of the eyes, but only one patient was found to be suffering from impairment of vision. While this would be expected in an endemic area where the disease is mild, it is interesting that impairment of vision should be almost absent from Ganawuri which is an epidemic area. It is also interesting to observe that Dr. J. H. Pasqual obtained similar results at Ganawuri.

Considering the number of injections administered, the number of arm abscesses due to faulty administration was very small. The mallamai, many of whom were only gaining experience, are to be congratulated on these good results.

Two of the treatment teams were under the supervision of senior mallamai and under the circumstances their work has been good, but I recommend that in future treatment should be under the supervision of a competent trained nurse.

During treatment at Kurmin Goro a few patients from the neighbouring Machi district of Jos division at the edge of the escarpment were found to have sleeping sickness. This led to a search for, and discovery of, tsetse fly (*Glossina palpalis*) at the top of the escarpment at Kibo. A similar state of affairs is, within my experience, to be found at Kwall, Karifa, and Tof, which are connected with the low-country by Kurumi. I consider that during future mass examinations of country along the foot of the plateau escarpment it would be advisable to extend the sphere of examination to such places and their immediate neighbourhood, otherwise *foci* of the disease will remain to constitute a danger to the area already examined and treated. Tof and its surrounding villages are at the top of the escarpment bordering Mama district of Southern division and in September, 1929 this area was fairly heavily infected, and I recommend that it should be examined in conjunction with the examination of Mama. Finally, after completion of treatments in the division, all sleeping sickness patients in Ayu district were re-examined by gland palpation, and

gland juice, blood film, and cerebro-spinal fluid examinations with interesting results. During this work five monkeys (*Macacus rhesus*) were inoculated intraperitoneally with blood from relapsed patients in the hope of securing "arsenic-fast" strains of trypanosomes for further research work at Gadau by Mr. A. W. Taylor, in connection with passage of such strains through the tsetse fly.

Nunku, the southern division, was reached on 7th November, and the mass examination of Nunku district began on the 8th November. Thanks to the active interest of Mr. R. L. A. Underwood, District Officer in charge southern division, the examination is proceeding favourably. Cases of yaws are being segregated in addition to those of sleeping sickness.

RE-EXAMINATION OF SLEEPING SICKNESS PATIENTS IN AYU DISTRICT, JEMAA DIVISION.

Out of a total of 172 cases diagnosed in April, 1931, there were seven deaths, leaving 165 who attended for treatment. Treatment with tryparsamide, based on 24 grammes per adult, was given in June and July. In November 155 were re-examined for enlarged glands and the presence of *T. gambiense* in gland juice and blood. The great majority showed either no glands or small firm glands as the result of treatment.

The spinal fluid was re-examined in 84, a large number of cases with original normal cell counts not having their C.S.F. re-examined; only seven of the latter class were re-examined as a check.

In the following table

Group 1 consists of those given full courses of tryparsamide, who had original increased counts.

Group 2, of those given full courses, who had original normal counts.

Group 3, of those given two injections only of tryparsamide who had original increased counts.

Group 4, of those given two injections, who had original normal counts.

Group 5, of those who were given no tryparsamide and who had original increased counts.

Group 5, one case which was given no tryparsamide who had an original normal count.

Group.	Treatment.	Original cell Count.	White Cell Count in C.S.T. after treatment.					Total Cases.
			Normal.	Reduced.		Unchange.	Increased.	
				Greatly.	Slightly.			
1.	Full course	Increased	26	10	5	5	1	47
2.	Full course	Normal	7	...	...	...	...	7
3.	2 inj. ...	Increased	15	1	...	1	1	18
4.	2 inj. ...	Normal	7	...	...	...	2	9
5.	Nil ...	Increased	...	...	...	...	2	2
6.	Nil ...	Normal	1	...	...	...	...	1
								84

The greatest interest attaches to Group III. who only had two injections of tryparsamide and who originally had increased cell counts. It is seen that 15 out of 18 are apparently cured by this small amount of tryparsamide. I have the greatest confidence in the work of the nurse who was responsible for continuing the treatment of these patients with injections of water after the first two tryparsamide injections. But these results seem to warrant a further investigation into this question in a similar endemic area where the disease is mild.

APPENDIX C.

REPORT UPON X-RAY DEPARTMENT, AFRICAN HOSPITAL,
LAGOS.

BY

A. J. MURRAY, M.C., M.B., Ch.B., D.M.R.E.

REPORT OF X-RAY DEPARTMENT FOR 1931.

Fractures, as usual, comprise the majority of findings in the routine work of the department.

Examinations of the alimentary tract were frequent, the number being 54—almost the same as for last year. More natives are being sent for barium meals, but it is rare for anything definitely abnormal to be seen.

The total number of cases X-rayed in the department was 678, divided up as follows:—

1. Upper limb	...	...	...	...	239
2. Lower limb	...	...	...	...	215
3. Spine	...	...	...	...	24
4. Skull	...	...	...	...	20
5. Chest	...	...	...	...	74
6. Alimentary tract	...	...	...	...	54
7. Urinary tract	...	...	...	...	14
8. Jaws	...	...	...	...	29
9. Uterus	...	...	...	...	8
10. Gall bladder	...	...	...	...	1

The chief findings were:—

1. Arthritis	...	...	...	...	16
2. Dislocations	...	...	...	...	11
3. Foreign bodies	...	...	...	...	12
4. Fractures (a) upper extremity	...	...	...	...	127
(b) lower extremity	...	...	...	...	64
5. Necrosis of bone	...	...	...	...	8
6. Osteomyelitis	...	...	...	...	30
7. Periostitis	...	...	...	...	15
8. Others	...	...	...	...	16

Electro-therapeutics.—There were altogether 236 new cases for the year and the total attendances 2,765.

The chief diseases were:—

1. Adenitis	...	...	...	...	13
2. Arthritis	...	...	...	...	39
3. Granuloma	...	...	...	...	3
4. Injury	...	...	...	...	7
5. Keloid	...	...	...	...	7
6. Lupus	...	...	...	...	3
7. Neuritis	...	...	...	...	5
8. Rheumatism	...	...	...	...	38
9. Synovitis	...	...	...	...	12
10. Tinea—various	...	...	...	...	41
11. Ulcers	...	...	...	...	46
12. Warts	...	...	...	...	5
13. Various	...	...	...	...	17

The results in various skin diseases with the mercury vapour lamp were very striking in some cases; whilst diathermy proved most beneficial to many chronic sufferers where pain was the predominating feature and where it has resisted the more usual forms of treatment. X-rays, too, proved of great value in some skin cases where the disease seemed to be progressing in spite of treatment.

In some ulcer cases where implantation grafts had been used on the raw surface some excellent results were obtained, new skin growing rapidly from the graft area very quickly.

APPENDIX D.

YAWS AND SYPHILIS AT CALABAR.

BY

G. W. ST. C. RAMSAY, M.D., CH.B., F.R.F.P.S.,
Pathologist.

YAWS, AND SYPHILIS IN CALABAR.

AN ANALYSIS OF 5,000 SACHS-GEORGI TESTS.

In parts of the southern provinces of Nigeria yaws is well known to be a considerable factor in the morbidity of the population, and during the time I was stationed in Calabar I endeavoured to assess the extent to which the children were infected. To this end, 2,600 children between the ages of four and 16 years were examined and, for purposes of comparison, a series of 2,400 adults was examined at the same time. 1,690 children were obtained from the schools in Calabar and the remaining 910 children together with the 2,400 adults were taken at random from the out-patient department and wards of St. Margaret's Hospital.

TECHNIQUE.

In each case 5-10 c.c. of blood was drawn from the arm and the serum submitted to the Sachs-Georgi test. The bloods were taken in the morning and the tests were put up in the afternoon; the results being read on the following morning after the tubes had been rather over 18 hours in the water bath at 37°C. The antigen used was that supplied by Messrs. Burroughs, Wellcome & Co. in 1 c.c. ampoules. The Sachs-Georgi test appears to be accepted as being reasonably accurate, and it has much to commend in places where the Wasserman test cannot be carried out.

INCIDENCE OF YAWS IN CHILDHOOD.

No serological test has yet been evolved by which yaws can be differentiated from syphilis and, therefore in places where the two diseases co-exist, a positive reaction to a test such as the Wasserman or Sachs-Georgi indicates only that the individual has or has had either yaws, syphilis, or both. Clinically, the differential diagnosis is often difficult and, in consequence, workers may vary in their assessment of the incidence of syphilis or yaws in the same locality. The difficult cases are chiefly those presenting the tertiary lesions seen in adult life, and even experienced clinicians will readily admit that in such cases it is frequently difficult, if not impossible, to distinguish yaws from syphilis. On the other hand, in childhood it is the characteristic primary and secondary lesions of yaws which most commonly occur, and the diagnosis is, therefore, rarely in doubt. Further, among children of 16 years of age and under acquired syphilis is most unlikely to occur, even in the tropics, and congenital syphilis is so rarely encountered (0.04 per cent of patients in Calabar) that there is justification for eliminating syphilis as a factor in childhood; and it seems reasonable, therefore, to assume that in children under 16 years of age a positive Sachs-Georgi reaction is due only to infection with *Sp. pertenue*. If this assumption is accepted, then it follows that the figures given below indicate the average incidence of yaws in the Calabar children; and that they present a more accurate indication of the extent of the disease than is possible clinically, because a serological study will reveal the presence of yaws in cases where signs and symptoms remain latent or have passed off.

TABLE I.

INCIDENCE OF YAWS IN EARLY LIFE.

<i>Age.</i>	<i>Total.</i>	<i>Positive sera.</i>
		%
4	200	32
5	200	39
6	200	42
7	200	40
8	200	38
9	200	37
10	200	37
11	200	34
12	200	35
13	200	34
14	200	32
15	200	32
16	200	31
	<hr/> 2,600 <hr/>	<hr/> 35.6 <hr/>

From the above table and graph I it will at once be observed that from the fourth year there is a rapid rise in the incidence of yaws, and that it reaches its maximum by the sixth year. Thereafter, until the sixteenth year there is a steady fall in the proportion of infected children; a fall which averages about one per cent per annum.

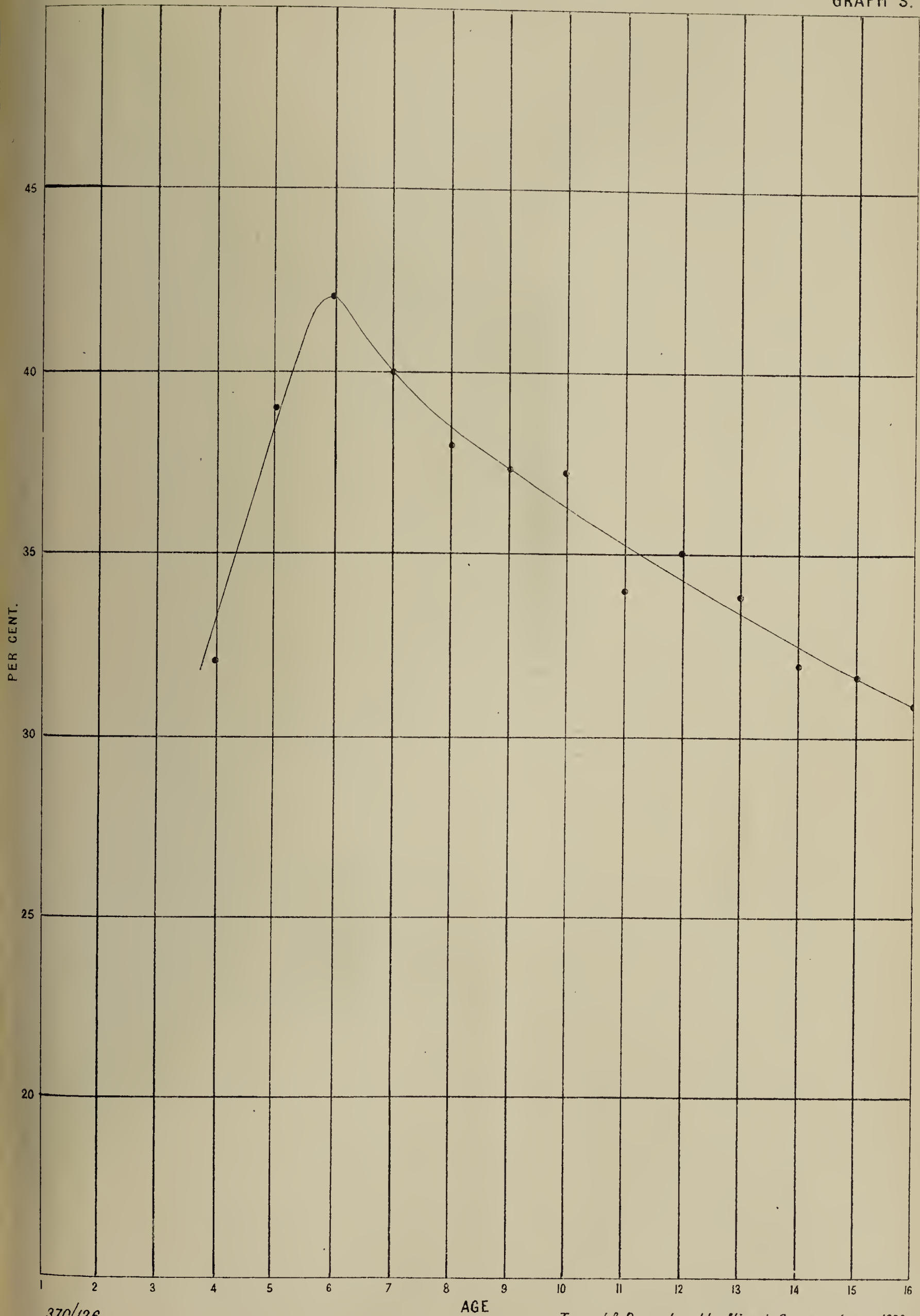
What is the explanation for this gradual decline in the incidence of yaws with advancing years? Surely the figures indicate that between the sixth and sixteenth years there is a tendency for the disease to burn itself out and for spontaneous cure to occur; a conclusion which is not entirely unsubstantiated, because Schobl has observed the same phenomenon in his work on experimental yaws in monkeys. Further, these figures indicate that re-infection with yaws appears to be uncommon during this period. It is very seldom that the serum of an untreated case of syphilis becomes negative spontaneously, and yet syphilis is caused by a spirochæte morphologically indistinguishable from *Sp. pertenue* of yaws. Without venturing to discuss the vexed question of whether or not yaws and syphilis are one and the same disease, this spontaneous cure as manifested by the change from positive to negative in the serological reaction of a proportion of children with yaws is quite a good argument in favour of the view that they are separate and distinct diseases.

THE SACHS-GEORGI TEST IN ADULT LIFE.

In our analysis of the Sachs-Georgi test in early life it has been suggested that a positive reaction is indicative of infection with yaws alone, because it is held that syphilis, either congenital or acquired, is a negligible factor at this period. Our results also show that re-infection with yaws is not common in childhood. Among adults, on the other hand, the whole problem of the interpretation of a positive serological reaction is much more complicated. A positive Sachs-Georgi reaction may be due to infection with syphilis or yaws or both, and from table II and graph II it will be seen that, contrary to what takes place in childhood, the proportion of positive reactions steadily increases with the age of the subject.

INCIDENCE OF YAWS IN CHILDHOOD

GRAPH 3.



SACHS-GEORGI REACTION IN CHILDHOOD AND ADULT LIFE

GRAPH 4.

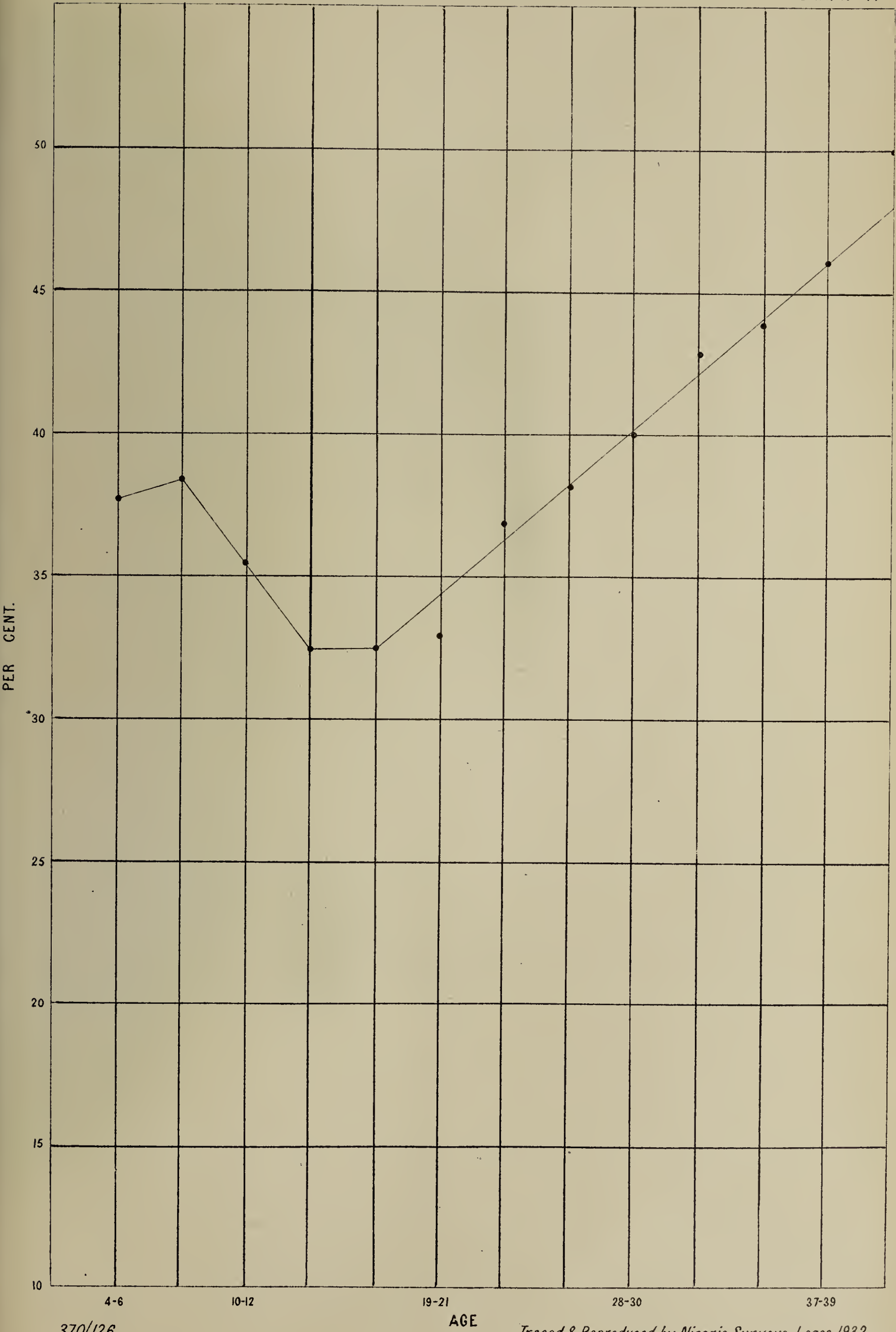


TABLE II.

SACHS-GEORGI TEST IN ADULT LIFE.

<i>Age group.</i>	<i>Total.</i>	<i>Positive sera.</i>
		%
16-18	452	32
19-21	223	33
22-24	261	37
25-27	418	38
28-30	431	40
31-33	250	43
34-36	183	44
37-39	145	47
40-42	137	50

It has been shown that in childhood the proportion of positive sera falls at the rate of approximately one per cent per annum, whereas it will be seen from graph II that in adult life it rises by 0.4 per cent per annum. This rise may be accounted for in two ways, each of which is a factor, viz.: infection with syphilis and infection or re-infection with yaws. Contrary to what obtains in syphilis, it is a well-established fact that individuals who have suffered from untreated yaws may become re-infected with the same disease and, further, it has also been proved both clinically and experimentally (Schobl) that primary and secondary yaws may develop in a patient who at the same time bears the stigmata of tertiary yaws; this phenomenon being known as super-infection.

Now, if the spontaneous "burning out" of yaws which we have observed in childhood were to continue uniformly throughout adult life, then by the age of 40-42 years only six per cent would have the disease; and yet actually we find that yaws and syphilis together are present in 48 per cent at this age. Therefore, it might be that the difference between the expected and the actual figures—42 per cent.—represents the combined incidence of syphilis and re-infection with yaws. On the other hand, we do not know for certain that the decline in the incidence of yaws observed in childhood does continue at the same uniform rate in adult life; and, in fact, it is just as probable that it falls to a certain figure and there remains constant. The only method by which this point could be settled would be to make a comprehensive serological survey of the people in an area where yaws is prevalent and where syphilis is unknown. The writer, unfortunately, is not aware if such an investigation has been undertaken anywhere by a reliable authority. From a serological study such as is described here it is impossible to offer any opinion as to the ratio of syphilis to yaws among adults; and, therefore, the only conclusion that is justified by our analysis is that the increasing incidence of positive sera observed as age advances is due to infection with syphilis, yaws, and re-infection with yaws.

